AEA PHOENIX 2025

UPDATED: THE LATEST 2025 AEA CONVENTION INFORMATION

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JANUARY 2025
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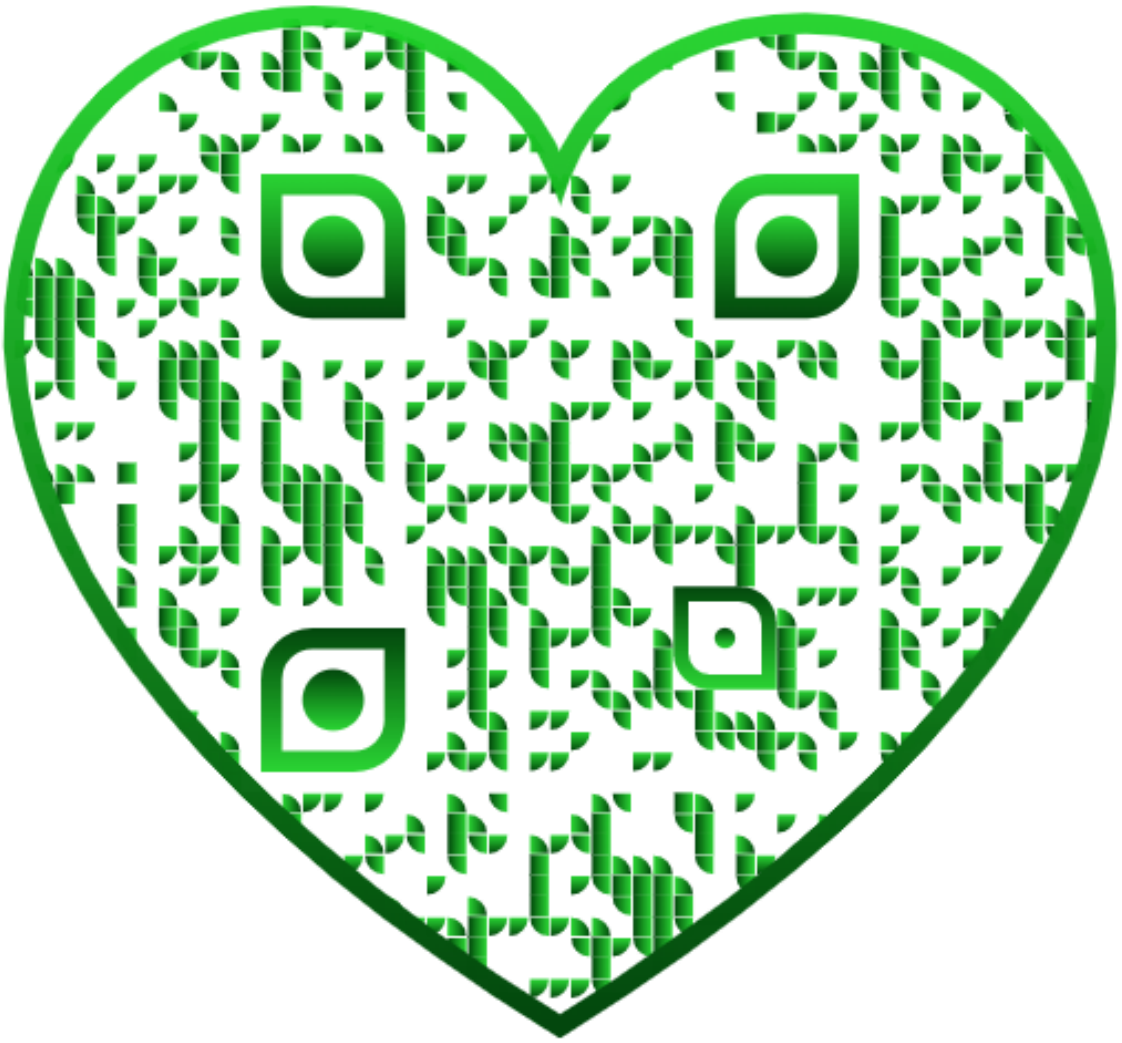

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Vol. 62 No. 1 / Advertisers Index: pg. 33 / avionicsnews.net

JANUARY 2025

4 **POINT OF COMMUNICATION**
Risking the usual: 5 years later

6 **AEA NOW**
Association news, events & information

14 **THE VIEW FROM WASHINGTON**
Why 'inquiring minds want to know'

16 **INTERNATIONAL NEWS AND REGULATORY UPDATES**

20 **COMBAT CONFUSION IN THE COCKPIT**
Software that can spot GPS spoofing

26 **MEMBER PROFILE**
Turbolyft builds mission-ready

30 **INNOVATIVE ADVANTAGE**
Simplifying the IFE conundrum

34 **HONEYWELL KEEPS SIGHTS**
On advanced air mobility

38 **MEMBER PROFILE**
MAAE finds the link

42 **THEORY & PRACTICE**
Enhanced zonal analysis procedure

46 **ON THE SHOP FLOOR**
Top-pick installation add-ons

49 **AEA CONVENTION INFORMATION**
March 18-21 in Phoenix, Arizona

62 **MARKETPLACE CLASSIFIEDS**
Jobs, equipment, calibration services

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RISKING THE USUAL: 5 YEARS LATER

Jim Rohn, the master of motivation, once stated, "If you are not willing to risk the usual, you will have to settle for the ordinary." Five years ago, the association's board of directors and staff started the process of risking the usual in a thorough analysis of our market, our mission, our membership and our services. The resulting strategic plan charted a course for the association and our board that has led to some exciting initiatives and provided a foundation for future growth and sustainability.

While the pandemic was interrupting business and stealing the headlines five years ago, the efforts of the association, the board, staff and our strategic planning partner were ongoing and steadfast in producing outcomes our current and future members would value.

MIKE ADAMSON

Some of the early work was foundational in establishing new standing committees, revising membership categories, updating bylaws, and improving the board member selection criteria and election processes. Other projects were more visible and included a new vision and revised mission statement along with the launch of a new corporate logo. All the above are important in making sure your association grows and sustains excellence.

Historically, the association has taken an indirect approach to workforce development through training and education that focused on solving workforce needs through specific technical and regulatory courses. When members had a problem, the AEA developed a solution. That approach continues to serve the industry well by training thousands of technicians at AEA headquarters, online and at our Regional Meetings and International Convention & Trade Show.

What's unusual in the new approach? With the aim of contributing substantially to the growth and availability of a workforce that is qualified and ready to meet the future needs of the aircraft electronics industry, the new workforce initiative is thinking bigger in its efforts. The more visible results of this strategic endeavor are the new AeroCareers.net website for aerospace career exploration, a revamped and free jobs board for members, the NextOp partnership for recruiting transitioning military members, and the addition of a dedicated workforce development director to the AEA staff. What isn't widely known yet is the behind-the-scenes work to develop curriculum, revise certification standards, and form strategic alliances designed to produce a pipeline of future aircraft electronics enthusiasts, certified professionals and qualified technicians. Through these partnerships and career and technical education pathways, the AEA and its partners can put an avionics career path in front of millions of students.

This year, we will risk the usual in a bigger way. I encourage you to attend the 68th annual AEA International Convention & Trade Show in Phoenix, March 18-21, where we will launch these extremely important initiatives and host our first-ever avionics competition in the exhibit hall. The AEA staff and board of directors have been hard at work over the last five years and are excited to share these extraordinary efforts with you in the new year. ❑

MIKE ADAMSON
President and CEO, Aircraft Electronics Association

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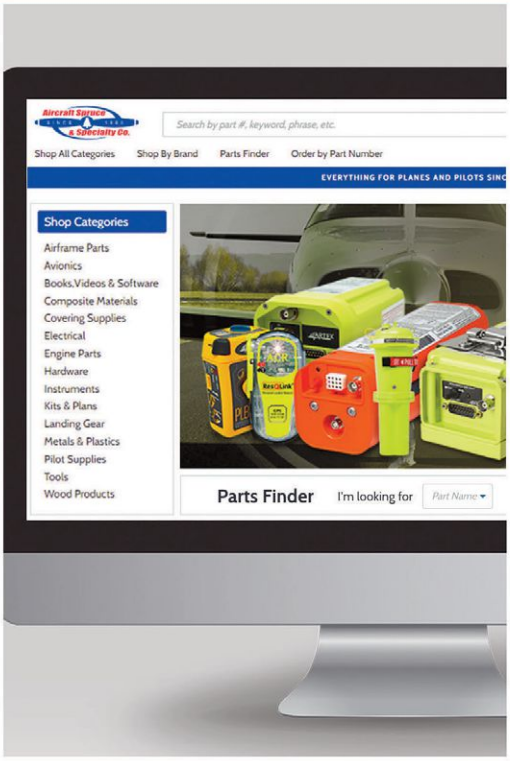

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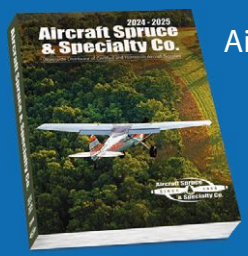

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ASTM'S COMPASS

The AEA has negotiated a contract to bring all of the ASTM aviation standards to the repair station members that need the standards for the continuing airworthiness of the general aviation fleet from light-sport aircraft to the new Part 23 as well as the foundational maintenance of electrical wire interconnect systems for the legacy GA fleet.

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In-person class sizes are limited at the AEA's Dan Derby Center for Professional Development in Lee's Summit, Missouri. Interested parties are encouraged to register well in advance to reserve a seat. Visit aea.net/training for more information.

Advanced Avionics Installation & Configuration

Jan. 6-8, 2025

In-person course; Lee's Summit, Missouri

Technicians will learn how to plan, install, interface, configure and check out an installation of a primary flight display, EHSI and GPS/Nav/Com consisting of dual Garmin GI 275, a Garmin GTN 650 touch-screen, and a Garmin GTX 345 transponder. Designed for technicians who have experience with avionics installation practices and are looking for more training integrating common general aviation installations.

SDR-OMNI Operations Training

Jan. 8, 2025

In-person course; Lee's Summit, Missouri

This half-day course is designed to provide avionics technicians with the knowledge and skills required to operate and configure the TIC SDR-OMNI all-in-one avionics test set.

Pitot-Static, Transponder, RVSM, and ADS-B: Testing & Inspection

Jan. 9-10, 2025

In-person course; Lee's Summit, Missouri

Attendees will learn the proper methods for conducting pitot-static and transponder tests and inspections. This two-day course offers a regulatory review and an explanation of the proper administrative procedures for completing these critical certifications. Preparing and performing RVSM inspection tasks. ADS-B session covering installation, wiring and return to service review.

Certified Repair Station Training

SOLD-OUT

Jan. 13-17, 2025

In-person course; Lee's Summit, Missouri

This weeklong course provides an interactive environment to learn, understand and implement the regulations that govern repair station design and operations. Current quality managers, technicians, mechanics, and repairmen who are involved in the management of a repair station as well as individuals looking to establish a 14 CFR Part 145 repair station should plan to attend. Building upon the base of knowledge of the regulations, the course includes a review of the FAA guidance and policy regarding the procedures to assure a repair station is operating within the criteria of its manuals.

Basic Wiring & Avionics Installation

Jan. 27-29, 2025

In-person course; Lee's Summit, Missouri

This course is designed for certificated repairmen, new avionics technicians, aviation maintenance technicians

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and recent graduates interested in improving or acquiring the skills necessary to perform avionics installations. This three-day seminar employs in-depth theory and hands-on lab exercises to immerse the attendee in the best practices used to plan, manage, and install a general aviation avionics panel.

AVX-10K and IFR6000/4000 Operations Training

Jan. 29, 2025

In-person course; Lee's Summit, Missouri

This course is designed to provide maintenance personnel with the knowledge and skills required to operate and configure IFR6000 and IFR4000 to verify and maintain transponder, UAT, TCAS, DME, ILS, VOR, Comms and ELT. It also includes a complete review of all features and benefits of the AVX-10K Flight Line Test Set with emphasis on testing transponder (Mode S and ADS-B In/Out), UAT, TCAS and DME.

Basic Pitot-Static & Transponder Theory, Testing & Troubleshooting

Jan. 30-31, 2025

In-person course; Lee's Summit, Missouri

This course is designed for entry-level avionics technicians or those looking for basic training on pitot-static and aircraft transponder systems. It covers the history and theory of operation of pitot-static instruments and transponders, as well as system setup, hands-on testing, and the troubleshooting skills necessary to perform FAR 91.411 and 91.413 checks.

Avionics Installation for Experimental Aircraft

Feb. 5-7, 2025

In-person course; Lee's Summit, Missouri

This course is targeted for the homebuilder or avionics technician who wants to learn about performing an avionics installation in an experimental aircraft. The class focuses on the Garmin G3X Touch system, and a simplified example harness is constructed as part of the hands-on portion of the class. While the G3X Touch system is the primary focus, the wiring principles and general guidance can be applied to any experimental avionics system. From the do-it-yourselfer to the avionics shop looking to carve out a niche, this class has something for everyone.

ADS-B Configuration, Testing and Troubleshooting

VIRTUAL LIVE COURSE

Feb. 6, 2025

This course is designed for currently employed repair station personnel and installers and maintainers of ADS-B systems. Approximately 4.8% of all general aviation ADS-B installations are noncompliant based on the FAA's ADS-B Performance Monitoring System. This course focuses on the proper configuration and testing of ADS-B installations to ensure your installation meets the performance requirements and regulations. Also included are troubleshooting tips and tricks that will help you resolve the common problems found in ADS-B installations. ❑

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Join aviation's technology experts in Phoenix, March 18-21

Advance registration is available online for the 68th annual AEA International Convention & Trade Show, the largest gathering of aircraft electronics manufacturers, distributors and approved maintenance organizations in the world. It is the platform of choice for the introduction of new avionics products and services coming to market in 2025. The event will take place March 18-21, 2025, at the Phoenix Convention Center.

Attendees must register by March 2 to receive the advance registration rate of $850 (AEA member rate) for a full convention registration, a savings of $100 per person off the on-site registration fee. The attendee full registration package includes: four days of technical training sessions; exhibit hall entrance for two full days with lunch; and networking with manufacturers and distributors. Register for the biggest training week of the year in the avionics industry at aea.net/convention.

To learn more about the regulatory, business and technical training sessions already slated for Phoenix, see the convention information beginning on page 49.

AEA PHOENIX 2025

Reserve your hotel room

Just 10 minutes from Sky Harbor International Airport, the headquarters hotel is a welcoming sanctuary in the heart of Phoenix. A direct link to make hotel reservations at the Sheraton Phoenix Downtown Hotel in the AEA room block is at aea.net/convention.

The AEA group rate is available until the deadline date (Feb. 21, 2025) or the room block is sold-out. The AEA does not work with any housing agencies to make hotel reservations on your behalf. We strongly suggest you work directly with the hotel when making your room reservations. ❑

ARE YOU UP TO THE TEST?

Take the Avionics News Technical Training Exam

The annual *Avionics News* Technical Training Exam is now available for avionics technicians and AEA members. By completing the exam, which covers regulatory and technical topics featured in the 2024 issues of *Avionics News*, technicians can get a head start on their FAA-accepted training. Individuals who pass the exam receive credit toward their repair station training program requirements, IA renewal, AMT awards, and the AEA Avionics Training Excellence Award.

Access to the test takes place for AEA members through the AERO platform, which allows exams to be graded in real time, certificates to be downloaded instantly, and a record to be retained for each participant.

Don't have all 12 issues of *Avionics News* from the past year? No problem. They are all available in the digital archives right at your fingertips. ❑

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Published annually by the Aircraft Electronics Association, the 2024-25 edition of the *AEA Pilot's Guide* is available upon request.

This year marks the 22nd annual edition of the *AEA Pilot's Guide*, a consumer's directory loaded with educational articles, timely information and data about the ever-changing world of avionics technologies. The publication helps pilots and aircraft owners make better buying decisions and locate nearly 1,300 AEA member companies in more than 40 countries, including approved maintenance organizations specializing in maintenance, repair and installation of avionics equipment in general aviation aircraft. It also includes the manufacturers and distributors of these products, as well as technical schools and universities, delegated engineering firms, and consultants for the industry.

Individuals residing in the United States may request a free copy while supplies last at aeapilotsguide.net/request.asp. ❑

Apply by April 1, 2025

AEA scholarship applications available online

The AEA Educational Foundation will award multiple scholarships for the 2025-26 school year to students pursuing a career in aviation electronics or aircraft maintenance, as well as students from AEA member companies.

Since its inception, the AEA scholarship program has awarded more than $1.5 million in scholarships. The deadline to submit a scholarship application is April 1, 2025. Applications are available at aea.net/scholarship. ❑

AEA Educational Foundation

Podcast

Shop Talk: How the repair station regulations support and encourage workforce development

Many avionics repair stations have been successful in recruiting, hiring and training their own technicians. However, in light of the many issues facing the industry, this episode discusses hiring challenges, rules governing training, recency of experience and documentation, training programs, and the "Moss interpretation" on supervision. Air Sense Avionics President Brian Yablon leads a Q&A discussion with the AEA's Ric Peri in this edition of "Shop Talk" on AEA Amplified.

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INFORMING MEMBERS ABOUT THE LATEST REGULATORY UPDATES

THE VIEW FROM

WASHINGTON

BY RIC PERI

AEA VICE PRESIDENT OF GOVERNMENT & INDUSTRY AFFAIRS

Why 'inquiring minds want to know'

"WE MUST BE ABLE TO ARTICULATE NOT ONLY WHAT WE DO BUT ALMOST AS IMPORTANT, WHY WE DO WHAT WE DO."

Inquiring minds want to know why we do what we do.

For a decade or so, there has been a traveling aircraft owner maintenance training program that encourages the owners to understand the regulations and dismiss, or at least push back, from maintenance that isn't required by the regulations. While the training is quite flawed from the maintainer's perspective and encourages risks and liabilities that many certificated mechanics would not personally accept, it raises the issue of knowing why we do the maintenance we do. We must be able to articulate not only what we do but almost as important, why we do what we do. The old adage, "we have always done it this way," simply doesn't fly – pun intended.

Many of us were taught by our mentors, who arguably knew more than us, so we simply accepted their guidance without question. Among other things, questioning authority, questioning our leadership, our mentors, simply wasn't done. I am not suggesting that their guidance was flawed; in fact, I would suggest that their counsel was accurate and valid. But their guidance was applicable to their experiences.

There is a well-understood story about norms and how understanding the origin of the norm may allow you to change your behavior. This one is from Six Sigma Development Solutions at https://sixsigmadsi.com/category/ssdsi-blog; however, there are dozens of similar stories throughout the web.

As the story goes. A husband and his wife were in their kitchen. The husband was sitting at the kitchen table reading the newspaper while his wife was preparing a ham for dinner. The husband watched the wife cut off about 1 inch from either end of

the ham. He asked why she cut the end off, proclaiming "that's a waste of good ham!" She said, "that's the way my mom prepared the ham." The husband asked, "why did your mom cut the ends off?" The wife didn't know.

Later, the wife called her mom to find out why she cut the ends of the ham off. Her mom said, "because that was the way my mom prepared ham."

The wife's grandma passed away several years earlier, but her grandpa was still living. She called her grandpa and asked, "Grandpa, why did Grandma cut the ends off of the ham?" He was silent as he thought for a moment. Then he replied, "so the ham could fit in the baking pan."

While presenting a recent Regulations of Maintenance training course, as we started the second day, the students recognized that the training was truly about why the MRO does what it does. In fact, understanding the regulations of maintenance is essential to fully know what, why, and how we do what we do.

Recently, in the United States, the Federal Aviation Administration published a legal interpretation on Sept. 3, 2024, called the Moss Interpretation, which caused significant angst. For those who have attended discussions of legal interpretations in the past, you know that whenever you read a legal interpretation, regardless of which authority issues it, there is a need for complete understanding of the question.

In the case of the Moss interpretation, the July 8, 2022, request for interpretation asked about the phrase "in person" under 14 CFR § 43.3(d). In the request for regulatory interpretation, Little Rock FSDO Manager Jonathan Moss asked two questions. First, he asked whether a supervisor must be physically present at the site of the maintenance, or if he may supervise remotely, through Zoom, FaceTime, live feed TV, photographs, downloadable video, or other electronic means. Subsequently, he asked: Assuming remote supervision is allowed, would he be allowed to provide the documentation for return to service electronically.

As I stated, the FAA's official interpretation was flawed. As a result of comments from the AEA, ARSA, other associations, the public and a few politicians, the legal interpretation was withdrawn until further internal FAA review could be accomplished. Although the interpretation as published is flawed, the question opens the opportunity to investigate why we do what we do.

Why?

Let us begin with the basic question, the "in person" aspect of 14 CFR § 43.3(d). The interpretation focused on "what" in person means rather than "why" in person. To understand why the regulation talks about in person, we need to start with the basic regulation 14 CFR § 43.3, which identifies those who are "authorized to perform

Continued on page 41

> "THE OLD ADAGE, 'WE HAVE ALWAYS DONE IT THIS WAY,' SIMPLY DOESN'T FLY – PUN INTENDED."

The AEA represents avionics businesses in more than 40 countries throughout the world.

INTERNATIONAL NEWS & REGULATORY UPDATES

BY RIC PERI

AEA VICE PRESIDENT OF GOVERNMENT & INDUSTRY AFFAIRS

The Aircraft Electronics Association's international membership continues to grow. Currently, the AEA represents avionics businesses in more than 40 countries throughout the world. To better serve the needs of the AEA's international membership, the "International News and Regulatory Updates" section of *Avionics News* offers a greater focus on international regulatory activity, international industry news and an international "Frequently Asked Questions" column to help promote standardization. If you have comments about this section, send emails to avionicsnews@aea.net.

UNITED STATES

Regulatory updates to BasicMed

On Nov. 18, 2024, the Federal Aviation Administration amended the BasicMed regulations to reflect the changes mandated by the FAA Reauthorization Act of 2024. The amendments to Parts 61 and 68 in this final rule align with the statutory charge set forth by section 8281 in the following manner:

- Increase the number of allowable passengers from 5 to 6 and occupants from 6 to 7 for covered aircraft;
- Increase the maximum takeoff weight from 6,000 pounds to 12,500 pounds for covered aircraft;
- Clarify that calendar months will be used in determining the duration of the comprehensive medical examination for those persons acting as the pilot in command or as a required flightcrew member for operations under §61.113(i);
- Specify that covered aircraft does not include transport category rotorcraft certified to airworthiness standards under Part 29; and
- Clarify which versions of FAA Form 8500–8, Application for Airman Medical Certificate, may be used to populate the questions in the BasicMed Comprehensive Medical Examination Checklist.

Section 815, BasicMed For Examiners Administering Tests or Proficiency Checks, provides that an examiner may administer a practical test or proficiency check if such examiner meets the medical eligibility requirements for BasicMed and the flight is conducted in a covered aircraft.

FAA requests public comment

The FAA is requesting comments from the public to determine the interest on the possible expansion of FAA's delegation program to include new certification tasks that might be accomplished by individual designees or organization designation authorization holders.

The expanded tasks being considered are certification of all commuter and on-demand operator types, excluding 10 or more passenger operations. The effort may require the FAA to initiate rulemaking corresponding with additional certification tasks for individual designees and a revision to policy for additional ODA authorized functions.

The request for comment can be found at https://bit.ly/3BiXfFO.

Comments must be received by Feb. 3, 2025. ❑

CANADA

CARAC and the plenary sessions

CARAC, the Canadian Aviation Regulation Advisory Council, is undergoing change, again.

CARAC was envisioned and put in place over 30 years ago to provide a forum between industry and Transport Canada Civil Aviation to lay out regulatory priorities, gain industry input and acceptance on changes and policy, and to provide a forum to constructively run working groups to prepare the drafts. Sometime around 2012, the CARAC forum began to see issues and a lag in its activities. Since then, there have been two reworkings of the CARAC charter and process, including a massive undertaking (2014) to review past activities, outstanding NPAs and prepare a five-year priority list.

Since 2020, the plenary sessions have been online and have been limited in scope. Most of the plenary sessions were geared toward TCCA updates on what has been completed and upcoming work. There was little opportunity for industry input.

Many in the industry have been discussing this issue with TCCA and, as a result, it has begun a review of the CARAC process in an attempt to make it function better.

In October, a survey was sent to determine how the industry would like to proceed with the plenary sessions and what would make CARAC better, and 87 industry members responded.

More than half the respondents wanted to have active participation, with all industry respondents saying that having the plenary session to be a consultation is the most valuable part of the process. In addition, 99% were looking for panel discussions and workshops. The industry also asked for better promotion of the CARAC processes and activities and the setting of clear goals and objectives.

In late November, TCCA held a session to go over the results of the survey and present the plan forward for CARAC. TCCA is revising the CARAC charter and preparing a list of priorities to bring to industry. As part of this, it will be conducting preliminary sessions with the industry on certain files over the first eight months of 2025.

The industry has been clear over the last two years that there is a need for CARAC to return to its roots and be more of a collaborative effort. The establishment of working groups meeting on a regular basis is needed to ensure that proper priorities are set based on industry needs. There is a massive change on the aviation front that is in motion along with the incredible need for new talent to enter the aviation industry. CARAC needs to become a partner in this and ensure the Canadian industry remains strong and excels.

SMS update

TCCA published the results of the comments coming from the notice of proposed amendment on safety management system implementation in November 2024. Overall, the comments received were positive and supportive of the proposed changes to the regulations. This is reflective of the preconsultations held on this topic and is a great example of how to move proposed regulations through the system.

The outcome is that TCCA will pursue the option to move all SMS requirements under Part I of the CARs and add requirements for design organizations and manufacturers, although it is not clear whether this requirement will be for TSO and STC holders. TCCA has committed to making this clearer prior to going to *Gazette* and is working with the FAA to ensure harmonization in this area.

Expect to see the new regulations published in *Gazette I* in early 2026. There is a lot of time to prepare. The AEA encourages you to begin to adopt SMS principles into your operations. There is a lot of good material on the association's website. The best way to make SMS work for you is to incorporate the principles into what you already do. For most, there is an existing quality system in place, which is about 90% of what is needed. There is also an industry standard available from the Aerospace Industries Association. The standard has been jointly prepared by industry associations in Canada, Europe, Brazil and the U.S. It is SM-0001 and is available on the AIA website.

The future of SMS implementation for smaller AMOs and other certificate holders is unclear. Expect that any decision on this front will not be made for at least two years. ❑

Updates continued on following page

Continued from page 17

EUROPE

EASA publishes annual safety review

The annual safety review supports the identification of safety issues, which are further assessed and prioritized using the experience of EASA member states and the aviation industry to connect the data with the current and future strategic priorities of the agency. The portfolio of risks (list of safety issues) as well as the safety priorities and mitigating actions are all contained in the European Plan for Aviation Safety.

The annual safety review goes beyond large commercial airplanes. It addresses a wide variety of air transportation means as well as other parts of civil aviation:

- Airplanes (commercial, specialized operations and noncommercial);
- Rotorcraft – best known to the wider public as "helicopters" (commercial, specialized operations and noncommercial);
- Balloons;
- Sailplanes (gliders);
- Unmanned aircraft systems / drones;
- Aerodromes and ground handling;
- Air traffic management / air navigation services.

The information can be found on the EASA website at easa.europa.eu by searching for 2024 annual safety review.

Agreement on civil aviation safety between the European Community and Canada Maintenance Annex Guidance Rev 3

EASA and TCCA have revised and approved their working procedures to include content revised to implement the following changes to Annex B:

- Mutual acceptance of component AMOs
- Component eligibility requirements
- Line station procedures
- Addition of SMS requirements
- Minor editorial changes
- Global change to replace National Aviation Authority with Competent Authority.

More information can be found on the EASA website with a search of "EASA Part-145 organisations located in Canada."

United Kingdom: Updated CAA-CAAS maintenance arrangement

The UK Civil Aviation Authority and the Civil Aviation Authority of Singapore signed a revision to CAP2083TAM: Technical Arrangement on Maintenance on 1 December 2024. It becomes effective on 1 January 2025. ❑

SOUTH PACIFIC

Australia: ADS-B rebate program, Round 2

The objective of the program is to incentivize voluntary uptake of ADS-B equipment in Australian-registered aircraft operating under visual flight rules and instrument flight rules to improve safety and efficiency for Australian airspace users.

Round 2 of the automatic dependent surveillance-broadcast rebate program is an extension and expansion of the ADS-B rebate program. The program was extended as part of the 2024-25 budget and will run over three years from 2024-25 to 2026-27.

Registered owners of crewed aircraft operating under VFR or IFR are shown in an approved registration database. Up to $5,000 per eligible aircraft covers up to 50% of eligible project expenditure. Only one grant per aircraft and per device is permitted (unless you meet the eligibility criteria in section 4.1 and 4.2 of the grant opportunity guidelines).

The program funds two classes of eligible ADS-B equipment (see Appendix A):

- Installed ADS-B equipment that air traffic controllers can use for aircraft separation purposes (referred to as ADS-B), or
- Portable ADS-B equipment for local electronic traffic information purposes (referred to as ADS B EC).

To be eligible, the aircraft owner must purchase and/or install in their registered aircraft:

- A device which provides ADS-B Out functionality or an ADS-B EC device but not both, after 20 December 2021, or
- A device which provides ADS-B In functionality or a device which provides ADS-B In and Out functionality, after 31 May 2024.

If a grant was previously paid in respect to their aircraft under ADS-B Round 1, they may be eligible to apply under the following conditions:

- The equipment adds ADS-B In functionality that was not previously available, or
- You are upgrading from an EC device to installed equipment.

More information on the round 2 of the ADS-B rebate program can be found at https://bit.ly/4f9t9SU.

New Zealand: Civil Aviation Act 2023 implementation

The Civil Aviation Act 2023 comes into effect on 5 April 2025. Nothing changes until then, and the aviation sector will continue to operate as it currently does under the Civil Aviation Act 1990 and Airport Authorities Act 1966.

CAA is undertaking work to implement a seamless transition, including:

- Civil Aviation Rules Realignment (a joint workstream with Te Manatū Waka Ministry of Transport)
- Drug and alcohol management
- Aviation safety
- Aviation security

The CAA NZ online magazine, *Vector*, contains a good description of what the New Zealand aviation industry can expect as well as the timeline for the implementation of each change. The *Vector Online* article titled "The New Act" can be found at https://bit.ly/3D9yegU.

Airworthiness and maintenance workshops

Airworthiness and maintenance workshop registrations for the beginning of 2025 are now live. Dates and locations for workshops in the second half of the year will be published after the first two workshops have occurred.

Topics to be covered include:

- Reasons for maintaining aircraft in an airworthy condition
- Relationship between operator, maintainer and regulator
- Certification lifecycle
- Rules – Parts 91 and 43
- Maintenance documentation
- Flight manuals
- Defect reporting
- Review of airworthiness.

Learn more at https://bit.ly/3D6KbDT. ❑

Updates continued on page 29

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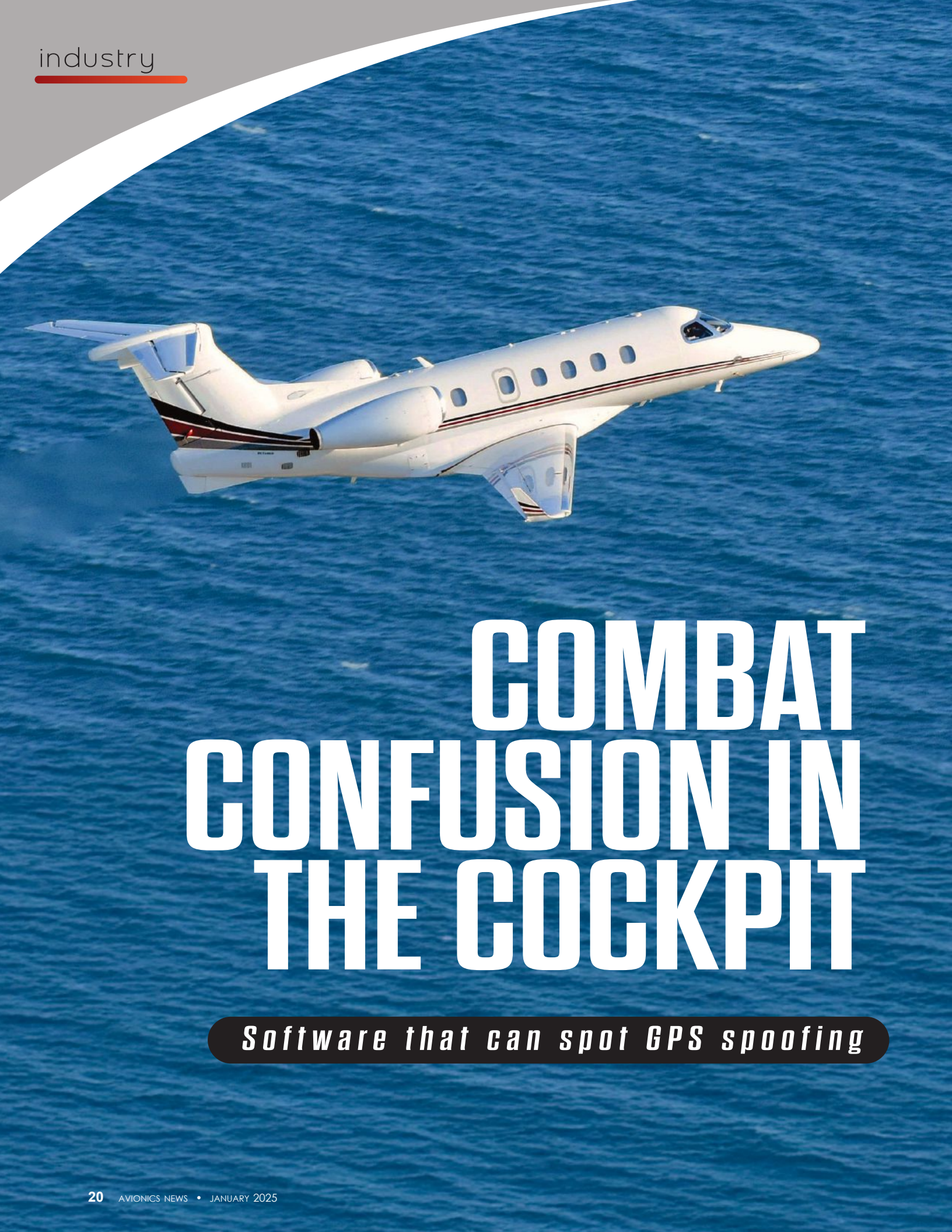


COMBAT CONFUSION IN THE COCKPIT

Software that can spot GPS spoofing

Photo courtesy of Send; Opposite page photo by David Syphers

STORY BY DAVID HUGHES

David Gray's company, Send, provides the Airtext+ low-cost Iridium connection to business and general aviation aircraft. And when GPS spoofing poked its ugly nose under the business jet tent, it got his attention.

Gray served earlier in his career as a United States Air Force instructor navigator, so when interlopers started messing with a customer's air navigation accuracy, he immediately wanted to do something about it. The anti-GPS spoofing software has been his pet project since 2023, and he is now more than a full year into the effort.

"When I first heard about spoofing, I thought any time something creates confusion in the cockpit, it is no fun and something we don't want to see happen," Gray said. "Many manufacturers don't want to talk about spoofing. What surprises me is that OEMs and equipment manufacturers have just said, 'Well, you know, it is what it is. We can't do anything about it, and we don't plan to. A solution would cost a lot of time and money, and it really isn't affecting much of our customer base.'"

Gray isn't satisfied with that answer, and after decades of working in the aviation industry, he is disappointed. "It leaves aircraft owners high and dry," he said. "If you have a variety of navigation sensors on the aircraft, there is something you can do about it. But for people who have purchased airplanes that are entirely based on GPS, it's a problem."

Martin Micek of Atmospherica Aviation operates four Embraer Phenom 300 jets that can carry five passengers 2,000 nautical miles at Mach 0.80 up to 45,000 feet. When one of these Phenom 300 jets was flying near Larnaca, Cyprus, Micek said the GPS was spoofed so its position appeared to be over Beirut-Rafic Hariri International Airport in Lebanon.

The cockpit panel display was soon populated with numerous failure messages. This included No FMS position, ADS-B Out and In not available, no wind data, Surfwatch fail, Runway Overrun Awareness and Alerting System fail, STAB Appr Fail, WShear not available, predictive windshear not available, TAWS not available and unable RNP. The only heading reference still working was the standby compass.

Continued on following page

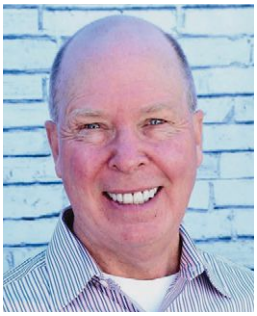
SOFTWARE THAT CAN SPOT GPS SPOOFING

Continued from page 21

As a result of similar experiences in Turkey, Micek won't fly a Phenom 300 into that country unless it is a VFR day due to the likelihood of GPS spoofing and high terrain.

While it is a high-speed, long-range jet, a single pilot can fly the Phenom 300. "I would hate for one of these single pilots in a GPS-based airplane to be in the weather and be in a situation he hasn't been trained for," Gray said.

At the 2024 AEA Convention in Dallas, Gray's company announced a software upgrade for the Airtext+ Iridium connectivity system installed so far on about 1,500 aircraft. Formerly known as Send Solutions, he started his company in 2016.



David Gray

The solution is designed to spot spoofing by monitoring multiple ARINC 429 buses on the aircraft and monitors GNSS signals from its own multiconstellation GNSS receiver. "We're listening to all of these 429 inputs, looking at things that happen with the GPS signals, and the clock, so we know when a spoofing event happens," Gray said. "Then we alert the pilot and within seconds send a message to the FAA or any other authority in other parts of the world. The message states this is the aircraft, this is the altitude at this location, and it's experiencing spoofing or jamming (jamming is far more obvious.) And when the aircraft comes out of spoofing, we can also send that information immediately rather than wait to report to authorities after the aircraft lands."

Todd E. Humphreys

He thinks crews should respond as if they are reacting with actions written in boldface just as with an engine fire. Deselect the GPS from providing position computations on the FMS, disconnect the autopilot and fly flight plan heading manually, and don't make any altitude corrections.

Airtext+ also maintains an independent dead reckoning position. The anti-spoofing software identifies the last valid position so pilots can use that to DR until GPS service is restored. Gray said he is working on a way now to update the Airtext+ dead reckoning position with VOR and DME to supplement the pilot's understanding of where the aircraft is located and where it is headed.

Gray laments that pilots and air traffic controllers are not being trained to spot spoofing. He isn't aware of any pilot training curriculum that includes it after talking to several simulation training companies, including Flight Safety and SIMCOM.

Gray understands that a false GPS signal generated by spoofing can be received at distances of 200 nautical miles on either side of its transmission site so an aircraft may have to fly a long way to exit the spoofing area. "It's entirely possible that you could fly for 400 nautical miles in a spoofed situation," he said. He bases this on information gleaned from Todd E. Humphreys, an award-winning engineering professor at the University of Texas who keeps track of worldwide spoofing incident reporting.

GPS spoofing can fool GPS systems on aircraft into calculating a position hundreds of miles from the aircraft's actual position. It then can feed this erroneous data into other navigation systems on the aircraft, including the flight management computer guiding the aircraft. A map shift might make the crew suddenly think they are flying over Belgium, not the Netherlands. This type of interference could ruin a crew's day and put the aircraft in jeopardy.

Airtext+ is a relatively inexpensive connectivity platform using Iridium. Gray said it costs about $35,000 – half for the hardware and half for the installation. It can connect aircraft ranging from a Boeing 737 to a Cirrus.

Customers can pay $500 per year for the first 2,500 test messages with Iridium and Airtext+ network connection and then reach any aircraft in the world within 10 seconds at a cost of 5 cents per word after that. Inbound email headers are sent up automatically for 10 cents each, which contain the subject line and timestamp. Emails selected can be downloaded in text-only format for between 25 cents and $1. Voice calls cost $1.51 to $2.53 per minute based on current Iridium service plans.

Some business jet operators who have broadband air-to-ground or satcom connectivity in the back of the airplane also have Airtext+ for use in the cockpit.

Gray noted that OPSGROUP, a publicly available website, provides good reporting on GPS jamming and spoofing incidents affecting civil aviation. This organization has 8,000 members in international flight operations, including pilots, flight dispatchers, schedulers and controllers. Members get daily briefs and ops alerts.

OPSGROUP founder Mark Zee recalls on the organization's website getting ready to fly a Fokker 100 scheduled flight from Rostov-on-Don just as BBC reported two helicopters had been shot down in Ukraine. Looking at his charts, he saw that his flight plan crossed that location.

He said that before the 2014 fatal shootdown of a Malaysian 777-200ER en route from Amsterdam to Kuala Lumpur (Flight MH17) with 298 fatalities, nobody thought

Continued on page 24

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SOFTWARE THAT CAN SPOT GPS SPOOFING

Continued from page 22

the war in Ukraine was a risk for airline overflights. However, several airlines had been avoiding Ukraine for months but didn't have a way to communicate this to other carriers. Airlines are stand-alone companies and competitors don't share information, Zee noted.

Flash forward to GPS jamming and spoofing incidents and OPSGROUP plays an important role in sharing information.

As most pilots would agree, NOTAMs can be too numerous and often confusing. In the stack of 100 or more NOTAMs for an upcoming flight, there may be a message hiding in plain sight that is critically important to the selected route. OPSGROUP serves as another source on spoofing, periodically sharing current information. The forum encourages pilots and controllers to say something if they see something. It provides GPS spoofing updates with a map, scenarios and guidance.

A Nov. 8, 2023, brief on the website by Zee began, "It has been five weeks since the real-world discovery of a fundamental flaw in avionics design. If a GPS signal is faked, most aircraft are incapable of detecting the ruse. For many, it has led to total navigation failure. For others, it has led to subtle and undetected erroneous tracking. In the worst cases, the impact has been severe: complete loss of onboard navigation requiring ATC vectors, IRS failure, and unnoticed off-track navigation toward danger areas and hostile airspace."

Zee added, "The industry has been slow to come to terms with the issue, leaving flight crews alone to find ways of detecting and mitigating GPS spoofing." Since the previous report in September 2023, OPSGROUP noted critical nav failures on departures from Tel Aviv leading aircraft toward Lebanon and spoofed signals in the Cairo flight information region showing a stationary position over Ben Gurion International Airport. The article went on to summarize all that was known about this situation.

Gray said the OPSGROUP information is helpful, "but what if you are the first aircraft being spoofed in that location?" That's where apps like Airtext+ can detect the first example of real-time GPS spoofing in an area along your route of flight.

The April 18, 2024, OPSGROUP briefing noted a growing number of GPS spoofing hotspots in the Middle East, plus ones in Pakistan, Niger and China. According to OPSGROUP, manufacturers have been slow to work out what advice to pass on to pilots and operators on what to do.

Gray said he thinks the ultimate solution may be GPS watermarking.

Logan Scott, a GPS consultant and expert with decades of experience and groundbreaking technical contributions, first proposed GPS watermarking in 2003 but was met back then with radio silence from the satellite navigation community. Today, the European Space Agency has already implemented digital signatures for Galileo satellites, and the USAF has a program named Chimera to do the same thing with one experimental satellite. But for airline aircraft and business jets to use an operational satellite verification technique, they would need new avionics with new software that would have to be type certificated. This process could take four years or more.

However, Galileo's Open Service Navigation Message Authentication is a free data authentication function for its users, including aircraft operators, which lets receivers on aircraft know the Galileo navigation message is authentic and hasn't been tampered with.

Another aspect of watermarking is putting these marks in the signals with a short-term key known to the satellite but not the user community. Later, the key is released to the user community and with the key, avionics can look back at signals transmitted up to three minutes previously to see if the watermarks are there. If not, the supposed GPS signal becomes suspicious.

Pilot training is the short-term answer so crews can recognize when they are being spoofed, Scott noted. Without this training, pilot confusion is likely. "Training isn't an ideal answer, but it's the best we have available now," he said.

It took so long for Scott to get anyone's attention about watermarking to guard against GPS spoofing that he started calling it his Casandra project. Cassandra was the Trojan preistess who was cursed with a gift of prophecy with the twist that no one would believe her predictions. Now GPS spoofing is becoming a big deal, and lots of experts are interested in watermarking.

Scott gave a presentation on protecting GPS to the National PNT Advisory Board in April 2024 (watch at https://bit.ly/3Z3En5m).

Gray is a serial entrepreneur. He started Flight Display Systems in the basement of his house in 1999 and shifted from part time to full time in 2001. In 2005, his son, Nick, joined the firm right out of college and built the marketing and international sales team while hiring 50 people. His mother, Susan, was the chief financial officer. The company had 160 products in in-flight entertainment, cabin management and special missions when it was sold in 2014 to a private equity group. ❑

Learn more about Send at sendaero.com.

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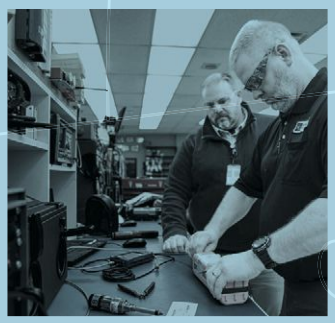

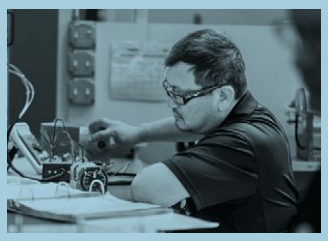

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Turbolyft builds mission-ready

STORY BY CHRISTINE KNAUER

At Pitt Meadows Airport in British Columbia, Canada, and Skagit Regional Airport in Burlington, Washington, Turbolyft's aircraft maintenance engineers customize and equip special mission rotorcraft. Whether it's helping operators fight fires, conduct aerial surveys, inspect pipelines and powerlines, report news from the air or chase bad guys, they're bringing the industry's latest technology and equipment to bear on Airbus Helicopters' AS350, AS355 and H130 airframes.

"Recently, we finished a 144-month inspection for the Miami-Dade Police Department and rebuilt their Eurocopter AS350 B3 from the ground up. It's equipped with fully customized avionics, an all-new upholstered interior, our horizontal stabilizer cameras and more," said Brandon Lowe, Turbolyft's director of sales and marketing.

"For major inspections, we'll take the aircraft down to the bare bones and rebuild it to be like new. During this process, we offer custom modifications, paint, component repair, avionics, interior upgrades and more. In past completions, we've performed the Soloy Aviation Solutions SD2/SD1 (engine conversion) and Heli-Lynx FX1/FX2 conversions as well."

For the Miami-Dade Police helicopter, Turbolyft consulted with the pilots and designed and built a custom dash with customized cyclic switches.

"We added a Garmin upgrade package with the G500, dual GTNs, an autopilot system and traffic system," Lowe said.

The team also installed an aft-mounted TrakkaBeam searchlight, forward-mounted TrakkaCam multisensor surveillance system, Becker AMU6510 digital audio management unit and Technisonic TDFM-9100 digital multiband transceiver.

Turbolyft not only modifies operators' existing helicopters, the team can build to suit from the company's in-house fleet, delivering an aircraft mission-ready. The options range from advanced communication systems and tactical equipment to create an airborne command and control platform, to search and rescue equipment, to outfitting for airborne medical services, and more.

"We own many AS350 airframes of all types. We can offer multiple configurations, depending on an operator's needs," Lowe said.

WEBSITE: turbolyft.com

WHAT THEY DO: Turbolyft offers rotorcraft maintenance, avionics and special mission completions.

EMPLOYEES: 35

FACILITIES: 2 locations

FOUNDED: 2019 by Jeremy Prasad and Abigail Prasad

AEA MEMBER SINCE: 2024

Photos courtesy of Turbolyft

When creating a new panel as they did for this Aerospatiale AS350 BA, Turbolyft's technicians utilize a virtual reality tool to help clients visualize equipment placement and pilot ergonomics, and then precision cut the panel in-house.

Heavy-duty protection

Turbolyft didn't start out specializing in complex, special mission modifications. It began with the recognition that, in transit and in the field, sophisticated rotorcraft parts and equipment need robust protection.

In Turbolyft's warehouse, employees fit custom-cut foam inserts into bright blue purpose-built Pelican shipping cases, a final step to optimizing the ideal defense against the elements. Each rugged, watertight Bluebox offers impact protection for a customer's rotorcraft engine, module or component or one of Turbolyft's several OEM-equivalent toolkits. Optional GPS/GSM tracking units provide real-time location reporting in transit and in the field. Customers can also choose to add optional shock sensors to record handling during shipment.

Continued on following page

Continued from page 27

"We saw a need in the industry for niche products and a higher attention to detail that wasn't present at the time," said Jeremy Prasad, who co-founded the company with his wife, Abigail, in 2019.

Prasad has 18 years of experience in the aviation industry, including serving as an aircraft maintenance engineer, production manager and general manager for Heliproducts Industries in Pitt Meadows near Vancouver. Like Turbolyft, it's a full-service provider for Airbus helicopters.

"The first steps for Turbolyft began with Bluebox and tooling manufacturing. The product lines were developed as an easier way for engineers and mechanics to have the necessary equipment to get the job done easier in the hangar or in the field. Soon after, we began parting out AStars, and from there, the backbone of the company's maintenance and avionics services were developed," Prasad said.

"Over time, our quality and attention to detail have paved a way forward for growth into other categories, such as utility aircraft builds, electronic news gathering builds, police builds and, most recently, new additions in-house like our upholstery shop."

Blue skies ahead

Turbolyft has grown "exponentially year after year," according to Prasad, with "newer and more complex customer requirements leading to expansion."

In 2023, Turbolyft expanded beyond its 10,000-square-foot manufacturing facility and separate 10,000-square-foot Transport Canada-approved AMO in British Columbia and opened a facility at Skagit Regional Airport. For the latter, Prasad is pursuing FAA Part 145 repair station certification and hopes to receive it in early 2025.

"We've also acquired a suite of STCs, including horizontal stabilizer cameras, a secondary avionics console and microwave downlink system. In 2025 and 2026, we plan to offer even more STC'd equipment to the market," Lowe said.

"Throughout 2025, we'll also be adding more capabilities to enhance our abilities to provide bespoke aircraft completions tailored to customers' needs." ❑

Turbolyft is an official distributor and installer of the Swiss Rotor Services Maximum Pilot View Kit, which offers pilots additional visibility when longlining.

Turbolyft's rugged Bluebox offers impact protection for rotorcraft parts as well as the company's OEM-equivalent toolkits.

Continued from page 19

FREQUENTLY ASKED QUESTIONS EUROPE

EASA Form 1

The following is from EASA FAQ n.19058.

QUESTION:

What kind of release document is considered equivalent to an EASA Form 1 under the terms of the US-EU Bilateral safety agreement? (AMC1 M.A.501(a)(1)/AMC1 145.A.42(a)(i)/AMC1 ML.A.501(a)(ii)/AMC1 CAO.A.070(a))

ANSWER:

According to the EASA FAQ:

Under the terms of an EU/US bilateral agreement:

Acceptance of new engine/components (and rebuilt engines) is governed by the Technical Implementation Procedure. The general principle is to accept such engine/components when released new on FAA Form 8130-3 using the blocks 13a to 13e (left side). Please refer to Section VII (from para 7.7 on) of the TIP for the detailed conditions under which this is acceptable.

Acceptance of used engine/components from a U.S.-based repair station is governed by the Maintenance Annex Guidance. The general principle is to accept such engine/components when subject to "dual release" on FAA Form 8130-3 (except where the component is not eligible for U.S.-registered aircraft), using the blocks 14a to 14e (right side).

- Block 11 should provide the status of the component (e.g. "overhauled").
- Block 12 should include (or refer to) detailed information on the work performed, the associated approved data (e.g. "Overhauled in accordance with CMM 111, Section X, Rev 2, S/B 23 and FAA AD xyz complied with") as well as the EASA Part-145 statement and approval number
- Block 14 should at least show "Other regulation specified in block 12" ticked.

Please refer to Appendix 1 of section B, paragraph 10 (Release and acceptance of components) of the MAG for the detailed conditions under which this is acceptable. ❑

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INNOVATIVE ADVANTAGE

SIMPLIFYING THE IFE CONUNDRUM

STORY BY DALE SMITH

Innovative Advantage's AVDS Node & Controller for videogaming capabilities

The growing popularity of in-flight entertainment and cabin management systems is closely tied to the steady increases in business jet range. The longer the flight, the more the passengers want to be entertained.

Of course, manufacturers were quick to offer a plethora of options, ranging from multidisc CD players to moving maps to hard drives full of movies. Then, as satellite connectivity gained in popularity, so did streaming live news, sports, and movies.

The only thing that didn't change was the complex nature of IFE installations. All the dissimilar hardware and software required mountains of drawings and countless hours to install and integrate their operation.

And woe was the avionics technician who had to troubleshoot any problems. That's

"WE ARE COMMITTED TO DOING BUSINESS NOW THE SAME WAY WE DID WHEN WE BEGAN IN THE GARAGE — BY BEING VERY CUSTOMER-CENTERED, WE STILL OPERATE LIKE A GOOD OL' AEROSPACE COMPANY. IF A CUSTOMER HAS A PROBLEM, WE ALL CAN JUMP TO PROVIDE A SOLUTION."

Greg Cornell, president of Innovative Advantage

Photos courtesy of Innovative Advantage

how it was until some 20 years ago when a young entrepreneur had an idea that would forever change how IFE systems were put together.

"It was the typical West Coast startup story," explained Greg Cornell, president of Innovative Advantage. "Our founder, Richard Morris, literally started the company in his home's garage. He was working for a big company that wasn't interested in his idea, so he quit and went out on his own.

"He had three good friends who also shared his vision, and when Richard told them about his move, they ran to his garage to be part of it. What they were creating was the aviation industry's first audio/video digital data distribution system – a singular backbone that would integrate all of the other components of the aircraft's IFE/CMS system."

As he explained, the "backbone" eliminated the problem of MROs having to figure out how to integrate all of the dissimilar hardware and software components into a cohesive system. It also made changing components a lot easier. But more on that later.

Cornell shared that with their depth of experience in business aviation IFE, the partners knew there was a need for this kind of revolutionary product. "Richard pitched the concept of AVDS to the market, and customers wanted it – thus launching Innovative Advantage," he said. "Richard is still our owner, and the other three founding engineers are still with the company, so our core is the same as when they started in the garage. We still have that base culture of loving technology and making it applicable to our customers' needs."

One is the most differentiating number

Cornell said that while the company has grown significantly in its 20 years, its success has been tied directly to doing one thing extremely well – providing a dynamic audio/video distribution system.

"We're really proud of the fact that this is all we do," Cornell noted. "Every day, we concentrate on how we can get audio, video and data around the cabin in the best way possible. We are experts on it, and when a customer has a problem or is looking to create an installation, we're here to help.

"From our high-level hardware perspective, our main product focus is our modular AVDS (audio/video distribution system) Backbone Node. The unit creates a dual fiber optic ring that provides fault-tolerant architecture supporting gigabit Ethernet and raw video for audio/video-on-demand, cabin connectivity, and other IFE/CMS capabilities.

"Instead of trying to figure out how they can integrate all the dissimilar components, the customer starts the system design by deciding what they want to accomplish – not 'What can I do,' but 'What do I want to do.' The core AVDS architecture has slots for more than 20 individual module cards to easily tailor the backbone to provide the capabilities they want.

Continued on following page

Continued from page 31

"And as these wants change, they can modify the cards to meet those evolving needs. It allows you to evolve the cabin IFE system without having to rip the whole thing out. That's not how we do it."

To illustrate his point, Cornell shared a recent example of how simple Innovative Advantage's backbone makes IFE/CMS upgrades.

"Our very first customer installation was in a Gulfstream G450," he said. "It was standard-definition video monitors and 32-pin iPod connectors – all very high-end for its day. But recently, the aircraft's owner wanted to upgrade to high-definition 4K video, Apple TV, and Roku streaming – all without having to redo the entire installation. We were able to accomplish it all by just making a few modifications to the monitors and the AVDS and CMS systems. That's a huge differentiator to our AVDS backbone."

While easing system installation and upgrades is certainly a top benefit of the AVDS, Cornell stressed that the system provides exceptional picture and sound quality regardless of the source.

He explained that thanks to its fiber-optic format, the system operates at very high bandwidths, ensuring the best possible audio/video quality with no losses, artifacts or latency.

"Our ADVS uses a distributed network topology without heavy compression techniques that compromise signal quality or introduce lip sync (latency) issues," Cornell said. "That's a big deal because one of the fastest-growing areas of IFE is gaming. No matter where you are in the aircraft, our system delivers really smooth video, which creates an exceptional gaming experience."

Taking the trepidation out of troubleshooting

According to Cornell, in addition to making the AVDS system extremely simple to install, the company founders wanted to ensure it delivers the seamless experience passengers expect.

"They created a tool called the AVDS Client, which gives installers, maintainers, and operators the complete autonomy to install, manage, and modify the system's operation easily and efficiently," he said. "It also allows customers to update their system's software and features easily.

"That's something that's novel in our industry. No lead times, no NRE required; you can make upgrades right on the wing in a matter of minutes."

Signal Converter Box

However, using AVDS Client just for setup and upgrades would be a waste of its capabilities, so the designers also created an array of advanced troubleshooting capabilities.

"The tool, maintained and updated by our Kirkland, Washington-based team, automatically configures network settings for easy wired or wireless connections to the system backbone," he continued. "We're always asking the question, 'How can we make it easier to troubleshoot?' and the latest answer is our One-Click Snapshot capability.

"If there's a problem with the system, all the customer has to do is call up their AVDS Client page and use the system's camera icon to take a snapshot of the system's configuration. Then they just type in the aircraft's serial number and hit 'Go.'

"Over the years, we've built a huge library of typical customer issues, and the new software will automatically go through and check all those examples to find one that matches the customer's situation. It doesn't only confirm the problem but will also tell you what to do about it.

"We get customers texting or calling telling us they just uploaded a report, and we can check it out for them in real time. Someone is always on call to respond to customer needs. When you call us, you are going to talk to someone who really knows our system and knows how to troubleshoot and fix problems."

He also stressed that the company's customer support focus is keeping the airplane flying. The company's newest tool for achieving that goal is the recent introduction of its fifth-generation software package.

"IAS 5 software is available now, and it has some big improvements with regards to system robustness and troubleshooting," Cornell said. "We're all about fault tolerance and keeping the system going. This is a big step in that direction."

Another element in ensuring system uptime is understanding all of the other COTS units that connect to

the IA AVDS. Cornell explained that this is another area that separates IA from other companies.

"With the decades of IFE/CME system experience our team has with IFE and CMS systems, there are times when they are on the phone with a customer or MRO technician, and they actually end up helping them troubleshoot other components in the IFE system," he said.

Cornell stressed that they're very proud of the company's willingness to work closely with its customers, even to troubleshoot a federated box.

"What avionics shops and MROs need to know is that if there is something their customers want to be integrated into their cabin, IA can make it easy to do," he said. "It doesn't matter if it's a VR headset, Wi-Fi connectivity, more USB-C ports, or whatever. In fact, we're seeing these partial installation/upgrades as becoming very popular now with operators. No matter the size or scope, we have the experience to get it done."

Speaking of installations, while IFE/CMS has become synonymous with large cabin jets, Cornell stressed that they're seeing increased activity from owner/operators of smaller cabin turboprops and jets.

"What's popular right now is installing our stand-alone upgrade Signal Converter Box to create a really nice entertainment section on a credenza or bulkhead," he said. "It's a small signal converter box that handles HDMI, USB-C, SDI, and analog audio so we can create a very nice, stand-alone entertainment system that's all integrated but not part of a larger CMS system."

A truly single-minded approach to success

While Innovative Advantage has built its business on providing simple solutions to complicated technological situations, Cornell explained that the company's most significant differentiator has been its steadfast commitment to exceptional customer support – and that's not going to change.

"We are committed to doing business now the same way we did when we began in the garage – by being very customer-centered," he said. "We still operate like a good ol' aerospace company. If a customer has a problem, we all can jump to provide a solution.

"Even if they're trying to integrate new digital systems with legacy analog equipment, they can just send us a list of what they want to accomplish, and we can figure out if it's doable or not. No matter the size or complexity of the installation, we have the experience and expertise to create a cost-effective solution." ❑

Learn more about Innovative Advantage at in-advantage.com.

Advertisers Index

Aero Standard Calibration. 63

Aircraft Electronics Association. . . IBC, 29

Aircraft Lighting International 7

Aircraft Spruce 5

Airtext 45

AVweb. 63

Cal Labs 63

CiES 19

Cincinnati Avionics 62

Corporate Angel Network 61

Dallas Avionics . . . . . Inside Front Cover

Device Technologies. 48

Duncan Aviation 25

EDMO. . . . . Back Cover

Garmin 3, 62

Schweiss Doors 63

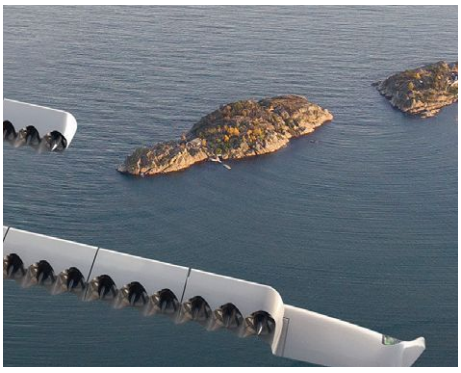
Tech-Aid Products. 63

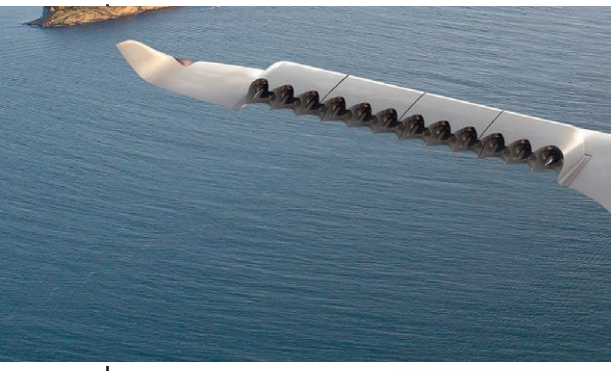
TGH Aviation. 23

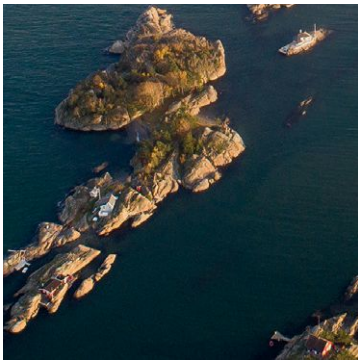
Tri-Star Technologies 13

True Blue Power. 1

Vertical Aviation International 64







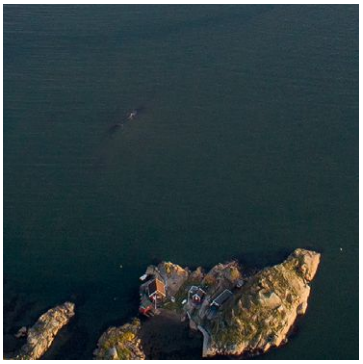


Photo courtesy of Lilium

STORY BY
DAVID HUGHES

HONEYWELL KEEPS SIGHTS ON ADVANCED AIR MOBILITY

Honeywell is engaged in a half dozen projects developing integrated cockpits for electric vertical takeoff and landing aircraft, and it is advancing the interests of the fledgling AAM industry in the nation's capital.

In September 2024, the company hosted its third annual Advanced Air Mobility Summit in Washington, D.C. Its executives hosted panels of U.S. and overseas government regulators, including the Federal Aviation Administration and Department of Transportation, trade association leaders, House and Senate staffers, AAM and UAS industry officials and experts on public perception and marketing. As with many such meetings, the one-on-one networking over coffee was just as valuable as the presentations.

It's not that everything is coming up roses in the nascent AAM market. Investment money is drying up for some struggling eVTOL startup companies, and it may cost more to operate the aircraft than originally thought. Meanwhile, battery technology isn't maturing as fast as hoped.

"We have always expected consolidation and do not think 30 to 50 OEMs will get their aircraft to market," said David Shilliday, Honeywell's vice president and general manager for AAM. But Honeywell is customizing its new Anthem avionics system for aircraft being developed by Vertical Aerospace, Lilium and Supernal.

Many participants in the summit talked about trying to make sure that the United States is a global leader in design and implementation of AAM aircraft, including eVTOLs. The National Aeronautics and Space Administration defines AAM as including low-altitude passenger transport such as air taxis, cargo delivery and public service capabilities such as emergency medical flights. AAM is closely related to urban air mobility, and NASA thinks a wide variety of air vehicles might fly in urban areas. NASA believes there are many potentially viable designs for aircraft there, including tiltduct, tiltwing, tiltrotor, multi-tiltrotor, quadrotor, lift+cruise eVTOL, side-by side helicopter and quiet single main rotor eVTOL concept helicopter designs.

"AAM and its progress is going to take the entire country," said Christopher Coes at the summit. He is acting undersecretary of transportation for policy at the U.S. Department of Transportation. Coes noted that in the last several years, the administration, Congress and the FAA have been pursuing AAM, not just talking about it.

"I'm truly excited about the future of AAM in the United States and our ability to lead the field and win the future," Coes said. "We will do this … with a vision that's founded on guiding principles around safety, accessibility and affordability. We will lead by pioneering safety regulations and standards that not only keep pace with the technology, but also provide certainty to our private partners."

Coes's team at DOT has been working for two years on an interagency effort with two dozen federal agencies to "develop a cross-government approach to assure that advanced capability is not only here in America but also ensures the strongest footing to win the future globally."

Photo courtesy of Honeywell

Honeywell Aerospace Technologies President and CEO Jim Currier (left) and U.S. Rep. Rudy Yakym (right) at the Honeywell AAM Summit in Washington, D.C.

Ed Bolen, NBAA president and chief executive officer, led a panel discussing this AAM intergovernmental working group, which is expected to issue a report on the U.S. government strategy on AAM later this year. It will have sections on aerospace, infrastructure, security, research testing and technology, community engagement and workforce development. The IWG has met with 120 subject-matter experts in agencies across the government and is preparing 36 recommendations for the report.

"Participants across the government see a wide variety of use cases and the terrific potential of these technologies," said Carol A. (Annie) Petsonk, a lawyer who is assistant secretary for aviation and international affairs in a DOT international office. "They all want the United States to be a leader at home and abroad in the framework for advancing AAM."

Continued on following page

Continued from page 35

"There is a recognition across our government that great cultures and great civilizations have always had great transportation," Bolen said. "All roads once led to Rome, and now we have an opportunity to improve AAM and make it more accessible."

While an eVTOL aircraft was not allowed to fly at the Paris Summer Olympics in 2024, government officials on the IWG have seen AAM aircraft flying in demonstrations in the U.S.

John Langford, founder and CEO of Electra in Manassas, Virginia, noted in his question as a member of the audience that an eVTOL was flown in New York City and "the reaction was the opposite from Paris. People in Manhattan loved what they saw and asked how soon we can get it because it's so quiet." Langford's company is developing a hybrid-electric short takeoff and landing aircraft that can land in spaces as small as 300-by-100 feet. A football field would do if only local authorities will permit an eSTOL aircraft like this to land there.

Both Joby and Volocopter demonstrated their air taxi eVTOLs at the New York City downtown heliport in 2023.

More than a century before in 1909, Wilbur Wright introduced New York City to the first powered flight innovation in aviation. He flew the Wright Flyer taking off from Governor's Island, circling the Statue of Liberty and making a half-hour flight to Grant's tomb. The Wright Flyer did not have to meet the exacting government safety standards of today. eVTOLs will have to meet standards, including the European Union Aviation Safety Agency's requirement for a 10^{-9} chance of a fatal mishap or one chance in one-thousand-million flight hours (according to an email from EASA).

Volocopter had hoped to fly passengers in its two-seat piloted eVTOL aircraft equipped with 18 rotors to several vertiports at the Paris Summer Olympics but did not clear hurdles with EASA.

"Local opposition in Paris presented a major hurdle to plans to have AAM air vehicles operate there in a way that many of us believe would have showcased some of this emerging technology," Coes said.

The U.S. government is still talking about integrating AAM during the 2028 Summer Olympics in Los Angeles. The eVTOLs would transport spectators and connect local communities that don't have easy access to the Olympic sites. Coes noted that surface transportation is owned by state and local governments, so the federal government will have to work closely with them on this concept.

Rep. Rudy Yakym (R-Indiana), vice chair of the House Aviation Subcommittee, said he thinks having AAM aircraft operate at the 2028 Olympics would be a great way to showcase the technology and American leadership in the field. Jim Currier, president and CEO of Honeywell Aerospace Technologies, interviewed Yakym at the start of the summit.

"AAM is going to create the fourth leg on the stool of the aerospace industry," Currier said. "Companies like ours serve three verticals in aerospace: commercial, business jets and defense. The fourth leg of the stool will be AAM and UAM. When it is mature, this sector will be a $100 billion market." This is why Honeywell created an AAM business unit during the pandemic in 2020. "We are a big believer in it," Currier added.

Currier introduced Yakym, who is a lifelong aviation enthusiast and is pursuing his private pilot license. As a freshman congressman, he was pleased to be appointed as the vice chair of the House Aviation Subcommittee. He worked on the FAA reauthorization that mandated the agency move ahead on beyond-visual-line-of-sight regulation. Yakym said the reauthorization ensures the FAA doesn't "stand in the way of a new wave of aviation innovation."

A few weeks after the Honeywell AAM Summit, Yakym was reelected in November 2024 to Indiana's second congressional district that includes South Bend. It is the home of several manufacturing plants, and Honeywell makes braking systems there.

Yakym was shocked as a freshman Congressman when stakeholders met with him to discuss provisions of the 2024 FAA reauthorization bill. They complained that the FAA has yet to implement some provisions in the 2012 and 2018 FAA reauthorization bills.

He hopes there is not a repeat with the 2024 bill. "Unfortunately, we are already seeing a few troubling early returns," he said. Four days before the AAM Summit was the deadline for the FAA to post an NPRM for BVLOS operations, but it did not show up. This is the Part 108 rule for standardized regulations for drones to be integrated into the national airspace system. Lawmakers have been urging the FAA and DOT to get a move on with this NPRM.

Yakym noted he has had nothing but good interactions with FAA Administrator Michael Whitaker. Yakym said there is a happy medium on innovation where the FAA neither rubber stamps innovation nor destroys it. In his view, Congress needs to help the agency find that happy medium. He also said partnerships between Congress and industry are vital, and "we ask industry to keep an eye on where the FAA is doing well and where the agency is not doing well" and keep us informed.

Yakym said there also needs to be a balance between safety and innovation, so the safety aspect doesn't stop innovation. Public acceptance of AAM will be critical, but it can't be legislated or forced by Congress.

One stumbling block for AAM infrastructure projects including vertiports is the National Environmental Policy Act. It can take a decade to get a NEPA permit, and yet it only took five years to design and build the Hoover Dam. "We've got to get the federal government out of the way and allow people to do their jobs within a reasonable amount of time," Yakym said. He is working on permit reform.

Kristie Greco Johnson, senior vice president for government affairs at NBAA, asked Yakym for advice on driving the correct regulatory structure and policies to help advance the AAM industry.

Yakym made an interesting point that after the 2024 election there will be potentially 70 to 80 new members of the House who will need to be briefed on the AAM industry and its priorities. A few weeks later, Donald Trump and the Republican party won the election. Yakym said educating new members of Congress needs to be a continuous process. Companies need to introduce themselves and establish a relationship with the new representatives for their districts before they need to ask for something.

In response to a question from *Avionics News* to the FAA about the North Texas project to allow delivery drones from Walmart to be controlled at low altitude by private sector companies, Yakum endorsed pilot programs like this one. Yakym said the industry needs a couple of first downs, and pilot programs in specific regions is a great way to do that. If it works, the project could be rolled out to the entire state of Texas.

Vertical Aerospace was the first OEM to choose Honeywell technology for its eVTOL. It marked the first use of Honeywell's compact fly-by-wire system (the size of a paperback book). This system is designed to meet UAM safety and certification requirements. The FBW computer is the brains of the system. Then in 2021, Honeywell Anthem was selected for the next-generation flight deck and intuitive pilot interface for Vertical's VX4 demonstrator.

"In the technology we are developing, the pilot really isn't flying the air vehicle," said Michael Cervenka, chief technology officer of Vertical Aerospace. "Instead, the pilot is telling a series of computers what he wants the vehicle to do, where to go and what to avoid. The computer controls all of the different systems on the vehicle to make the pilot's directions happen reliably and safely."

In 2022, Supernal, a part of Hyundai Motor Group, signed an agreement to explore the integration of Honeywell Anthem into its eVTOL. A cloud connected system, Anthem can be customized for an aircraft platform, and pilots can customize avionics settings they want to retrieve and use for each flight. Supernal plans to have Anthem connect to complex vehicle systems and set the stage for increasing levels of autonomy when regulators allow for this. Supernal plans to use its automotive manufacturing experience to inform its eVTOL manufacturing efforts.

Honeywell is also working on the application of autonomous avionics systems for military applications. It is investing and collaborating with Near Earth Autonomy on multiple autonomous rotorcraft programs. This includes the use of a Leonardo AW139 helicopter in contested logistics and casualty evacuation roles. One Honeywell objective is to focus on retrofitting existing platforms to deliver a comprehensive logistics system for rapid entry into service.

Anthem will also be used by Boom Supersonic on its Mach 1.7 Overture supersonic cruise jet with a capacity for 64 to 80 passengers. For those who have flown on the Concorde, this new supersonic transport can't enter service soon enough. I was on the British Airways Concorde press trip when service was reinaugurated from New York City to London in November 2001, 15 months after the fatal crash in July 2000 at Charles de Gaulle airport.

When the pandemic started, Honeywell decided to form a new business unit to pursue the opportunities of electric flight. This was at a time when the business and general aviation industries were pursuing sustainability. Honeywell decided to run its UAM/UAS team to emulate the speed, flexibility and agility of a small company within the large Honeywell corporation.

In October 2024, Honeywell signed an agreement with Merlin, a company that is developing autonomous flight technology for fixed-wing aircraft, to bring autonomy to civil and military aircraft. Honeywell plans to integrate its Anthem avionics suite with Merlin Pilot, a non-human pilot system for special missions. Honeywell said the two systems complement each other. By automating key tasks, the combined system will enable single-pilot operations for a variety of models of civil and military aircraft.

Merlin recently won a $105 million production contract with the U.S. Special Operations Command and has partnered with the USAF Air Mobility Command and Air Force Materiel Command to integrate the Merlin Pilot on the C-130J and KC-135.

Also in October 2024, Lilium selected Honeywell to supply propulsion unit position sensors for the eVTOL Lilium Jet. The sensors determine the engine's exact position needed for a safe takeoff. Honeywell is an investor in Lilium and provides e-motors, avionics, onboard thermal management systems and the flight control computer. The Lilium regional jet aims for zero operating emissions using 30 electric-ducted fan engines. ❑

MEMBER PROFILE

MAAE LLC

LOCATION:
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West Liberty, KY 41472

PHONE: 606-362-6204

MAAE finds the link

STORY BY CHRISTINE KNAUER

Jeremiah Meyer's superpower is synchronizing different types of communication systems so police, firefighters and emergency staff in ambulances, airplanes and helicopters can talk to each other. From his hometown of West Liberty, Kentucky, to FEMA-deployed disaster zones, Meyer is called on to ensure effective communication between the services.

"When Air Evac started working with FEMA a few years ago, I was tapped as one of the radio gurus. I would go with the aircraft and coordinate with FEMA's technicians. I'd find out what frequencies and tech they were using and go back and modify the radios so everyone could talk to each other," said Meyer, a longtime avionics technician and aircraft mechanic with inspection authorization.

After A&P maintenance training at Spartan College of Aeronautics and Technology in Tulsa, Oklahoma, Meyer worked for the airlines for a few years then transitioned to performing helicopter maintenance and avionics for Omniflight Helicopters in Fort Wayne, Indiana. He moved to Kentucky in 2012 to assist the company with its West Liberty-based Bell 206L LongRanger.

"Air Evac has about four or five lead avionics technicians in the company," he said. "We back each other up if a major project comes along. Most of the time, I look after the helicopter that sits at the local hospital. Within my reach of about two hours, there's a fleet of eight or nine Bell 206L, Bell 407 and EC-135 helicopters that I help with from time to time."

The emergency air medical helicopters are primarily equipped with Cobham HeliSAS two-axis autopilot system, Garmin GTN 650 GPS/Nav/Comm/MFD, Garmin G500H flight display, Garmin HTAWS Helicopter Terrain Awareness and Warning System, Garmin GDL 88 ADS-B In/Out Datalink, Becker Mode S transponder, Outerlink Global Flight Data Monitoring System, SkyTrac satellite tracking system and ANVIS-9 Night Vision Goggles.

"Air Evac just added several new Bell 407GXi helicopters across the company, which feature the Garmin G1000H NXi flight deck," Meyer said. "We also have an IFR program about two hours from me. It's a Eurocopter EC135 that's pretty avionics heavy. It has full Garmin integration with Airbus's factory systems, traffic, dual pilot IFR, autopilot and more."

Air Evac's FAA-approved inspection program includes 50-, 100- and 300-hour inspections similar to annuals as

WHAT THEY DO: MAAE provides maintenance and avionics services for small general aviation aircraft and helicopters.

EMPLOYEES: 1

FACILITIES: 1,500 square feet

FOUNDED: 2022 by Jeremiah Meyer

AEA PROVISIONAL MEMBER SINCE: 2024

A&P mechanic and avionics technician Jeremiah Meyer owns a 1956 Cessna 172, which he acquired in a trade for avionics work. Also a deputy fire chief and volunteer firefighter, Meyer has been putting his avionics and electronics skills to use helping West Liberty's emergency services transition from analog to digital communication systems.

well as the more in-depth 600-, 1,200- and 2,400-hour inspections.

"We work with the FAA to break things up. During the inspections, we're able to incorporate a lot of the ICAs (instructions for continued airworthiness), including ADS-B, autopilot and transponder checks," Meyer continued. "We factor all of those into the double AIP program to keep aircraft downtime to a minimum."

Pursuing Part 145

It's the mostly predictable nature of Air Evac's helicopter maintenance that led Meyer to work on general aviation airplanes and small helicopters at West Liberty Airport during his own downtime. Along with the airport-based aircraft, he helps maintain training aircraft for flight schools and provides maintenance, annual inspections and avionics installations for owner-operators who fly in from eastern Kentucky, southern Ohio and northern Tennessee.

"I install Dynon systems, Garmin G3X flight displays, uAvionix's instrument displays and ADS-B devices, and Aspen E5 electronic flight instruments. I also do a lot of troubleshooting and smaller installations for many people," said Meyer, who provides services under the company name MAAE, which stands for Meyer Aviation and Aircraft Electronics.

Continued on following page

Continued from page 39

Jeremiah Meyer serves as avionics lead for Air Evac Lifeteam and routinely maintains this Bell 206.

"There's a big need in the area for general maintenance, especially for smaller aircraft like the Cessna 172s and Pipers. We have pilots out here in the country who are aviation enthusiasts with their first airplane. They want it reliable and safe, but they don't have a big budget. Plus, some of the shops in the bigger cities are backed up for like six or seven months. If I can help somebody follow their passion, that makes it worth it."

Over the last couple of years, Meyer has been pursuing an opportunity of his own – adding an FAA-approved Part 145 repair station. Certification fills a missing link for his business – the ability to perform pitot-static and transponder checks.

"I asked the FAA inspector what it would take to become a repair station," Meyer said. "He referred me to the AEA for its repair station training and other courses. He also suggested starting with 91.411 and 91.413 as those are the two simplest ratings to get a Part 145 repair station without having to dive into parts, fabrication and non-destructive testing.

"With a Part 145 repair station, I'll be able to do more and perform pitot-static and transponder checks when owner-operators have their aircraft in for other work. It'll be like a one-stop shop where everything is included in one price."

After writing and making FAA-requested edits to his quality control, training program and repair station manuals, Meyer has received a Part 145 repair station number and is awaiting final approval on his training.

"AEA is an invaluable resource for somebody like me out here in the field," Meyer said. "I really like the training options, from the in-person pitot-static classes to the online AERO courses like the indoc training for Part 43 and other regs.

"AEA offers some other valuable resources you don't think about until you need them like those for electrical load analysis checks and ICAs. It's great to have a place to go for a quick refresher. The avionics familiarization courses like those for the new Aspen systems are incredibly helpful too. The resources on AEA's website are just phenomenal."

Small town, big responsibilities

With training and Part 145 challenges solved, Meyer still has others. Eastern Kentucky's dense forests and mountainous terrain makes West Liberty rather isolated.

"It's kind of a step back in time, if you will," he said. "The conveniences of the big cities just aren't here. It's hard to find parts and tooling. It's hard to find technical resources to properly maintain an aircraft. If I need a part, the closest shop that has any kind of parts in stock is almost two hours away. It takes two days for an ordered part to get here. I can stock some things but not everything we need.

"People here enjoy and live by the old ways. When they see someone like me tailoring my business to them, they really like that. I show aircraft operators that they don't have to upgrade to expensive equipment. They can use what they have and comply with all the required technologies and mandates. Like with the 2020 ADS-B mandate, you don't have to spend $5,000 on a new transponder. You can get a uAvionix unit for half that."

Given the remote area, most people take on a variety of civic responsibilities, including Meyer, who serves as airport manager, volunteer firefighter and deputy fire chief. Lately, he's been helping the local emergency services transition from analog to digital communication systems. In West Liberty, where a deadly EF3 tornado destroyed much of downtown in March 2012, it's a crucial one.

"West Liberty has been rebuilding and is doing wonderfully now," said Meyer, who joined the fire department seven years ago. "It's a testament to the people who live here. I'm working with several others on ensuring all the county departments can talk to one another and training them on the new systems. Although the transition can be challenging, it doesn't have to be expensive, and it doesn't have to be scary. It makes their jobs easier.

"When the right systems are in place, it's interesting to see how people can interact over a radio. For example, you can have an ambulance on a rural road in Eastern Kentucky with the ability to call in a patient report to a helicopter flying overhead: 'We have a 43-year-old patient who had a stroke. Their symptoms are x, y and z. Here's your landing area. It has wires and a treeline next to it, but there's a firetruck positioned under the wires to help you see those.' That kind of communication adds a whole new level of safety."

Meyer enjoys being a part of the local community and helping emergency services and pilots operate safely. Balancing all of his contributions can be tricky.

"I'm just a one-person shop and I intend to keep it that way," he said. "There's a trust and an understanding that as a one-person shop it takes me longer. If they're OK with that, then I can keep their costs down." ❑

Continued from page 15

maintenance, preventive maintenance, rebuilding, and alterations." We recognize that § 43.3(d) applies to a person working under supervision. Why is this person under supervision? It is simply that they do not, themselves, have return-to-service authority under 14 CFR § 43.7.

As we consider 14 CFR § 43.3, the regulation is clear that a mechanic, repair station, air carrier, or commercial operator under Part 121 or 135 not only has the authority to perform maintenance, but 14 CFR § 43.7 also authorizes them return-to-service authority for the work they perform. In addition, a pilot may have return-to-service authority for limited preventive maintenance. And a manufacturer may have return-to-service authority for rebuilding and inspections of their products.

There are two "persons" who are authorized to perform work but do not have return-to-service authority: a commercial repairman working at a repair station or air carrier, and a person working under the supervision of a holder of a mechanic or repairman certificate.

So, why would a person be working under supervision?

A mechanic may not approve and return to service any aircraft or appliance, or part thereof, for which they are rated unless they have satisfactorily performed the work concerned (the task) at an earlier date. And if they have not been qualified on the task, they may demonstrate their ability under the direct supervision of a certificated and appropriately rated mechanic, or a certificated repairman, who has had previous experience in the specific operation concerned. (14 CFR § 65.81 General privileges and limitations.)

In addition to the basic requirements for a mechanic, the supervision requirements for repair stations are contained in 14 CFR § 145.153 Supervisory personnel requirements. Within the regulation, the supervisors must oversee the work performed by any individuals who are unfamiliar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations. In addition, the repair station must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions can perform the assigned task. (14 CFR § 145.163 (b)). The requirement for supervising a nonqualified person is to qualify them; it is considered on-the-job training, and active supervision is generally required.

Why are these individuals being supervised? Because they do not have the authority to approve and return to service their work.

Then we get to the rest of the story. How much supervision is enough? There are two criteria listed in 14 CFR § 43.3 (d). First, the regulation requires that the supervisor must personally observe the work being done to the extent necessary to ensure that it is being done properly. And secondly, the supervisor must be readily available, in person, for consultation. Again, we ask, why? I suggest that the requirement is to assure the trainee understands what, why and how they are doing certain tasks. The first requirement is imbedded in other regulations.

14 CFR § 43.3 (d) requires that the supervisor must personally observe the work being done to the extent necessary to ensure that it is being done properly. Realizing that the supervisor is the one who is approving and returning to service the work, we need to look at the requirements of 14 CFR § 43.9 (a)(4).

As you know, 14 CFR § 43.9 defines the content, form, and disposition of maintenance, preventive maintenance, rebuilding, and alteration records. Paragraph (a) describes the required maintenance record entries. Paragraph (a)(4) defines the approval for return to service for the work performed. In this subparagraph, we see that "If the work performed on the aircraft, airframe, aircraft engine, propeller, appliance, or component part has been performed satisfactorily, the signature, certificate number, and kind of certificate held by the person approving the work. The signature constitutes the approval for return to service only for the work performed."

I have talked to several members asking what the right amount of supervision is. The answer always is it depends. 14 CFR § 43.3 (d) requires supervision to assure the work is being done properly, and § 43.9 (a)(4) requires the person signing for the work to attest that the work has been performed satisfactorily. These two regulations are linked. How much supervision is needed? What is the risk? Can the task be inspected after the completion and determine completely that the task was done properly? Then likely less "active" supervision. On the other hand, if the task, or a portion of the task, is covered by subsequent tasks, a more active (in progress) supervision may be warranted.

While Moss's question seemed straightforward, it is only through the understanding of why we supervise that we can fully understand the supervisory requirements of 14 CFR § 43.3 (d). ❑

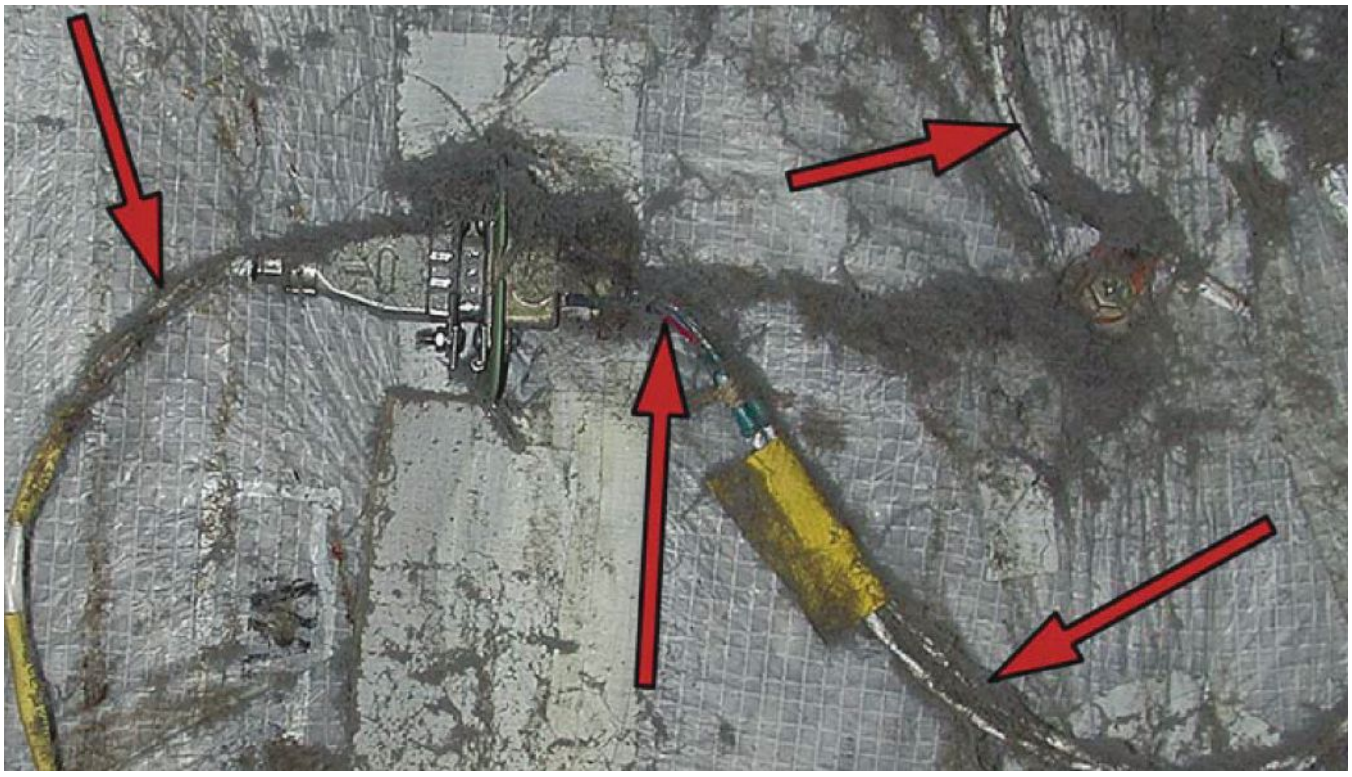
THEORY & PRACTICE

BY THOMAS INMAN

Enhanced zonal analysis procedure

In December's Theory & Practice column, I wrote how we can use guidance from Advisory Circular 25-26 to help us develop standard wiring practices documents. As an inspection method, the AC recommended using an enhanced zonal analysis procedure, or EZAP, the topic of this month's column.

Over the years, many of us have seen various levels of quality among electrical wiring interconnection systems. Some would serve as examples of how technicians should build an EWIS; others are downright



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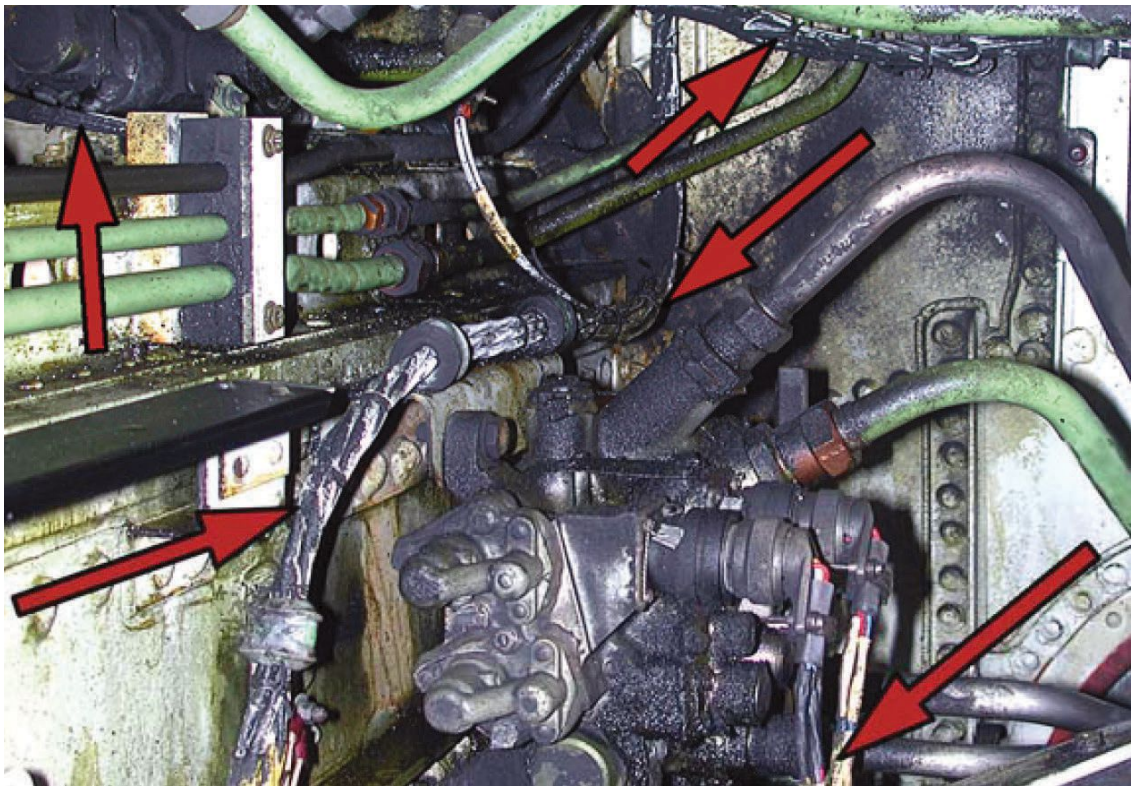

Grease contamination on wire bundles

scary, and we have seen all levels in between. Adopting an EZAP may help us keep the good examples good and fix the scary examples.

AC 25-27 describes EZAP and is aimed at transport category aircraft; however, using an EZAP system has benefits for all aircraft. Incorporating EZAP into inspection practices and into instructions for continued airworthiness documents will result in an overall improvement in safety. For those considering the use of an EZAP system, please download and read the relevant ACs.

The Federal Aviation Administration wrote AC 25-27 using a philosophy of "protect and clean as you go" during aircraft maintenance, repair and alteration. As young people, many of us worked in the food service industry. Those working in food service know workers are never done cleaning. In fact, the food industry developed an acronym to help workers adopt the clean-as-you-go philosophy. They call it CLAYGO. In aviation, we have an additional responsibility to protect our systems. EZAP guidance adds the protection aspect to the cleaning aspect of inspection and maintenance.

In general, the EZAP procedure guidance given in AC 25-27 will identify tasks designed to minimize the accumulation of combustible materials, detect EWIS component defects, and detect installation discrepancies that may not be detected reliably by preexisting maintenance procedures. Since non-EWIS items, such as plumbing, duct work, control cables, or other systems located in the zone can contribute to system degradation or failure, non-EWIS items must be analyzed along with the EWIS.

Shops adopting EZAP will find developing the new procedure can create many EWIS-related tasks, which will need to be merged into preexisting programs or procedures. The EZAP developers should compare these new tasks against preexisting tasks to ensure compatibility. Preexisting procedures and new EZAP procedures must be combined logically. The FAA warns against merely "tweaking" the EZAP to make the new tasks fit the old system.

AC 25-27 provides general information about causes of wire degradation, EWIS maintenance guidance, and recommendations for protection. As most technicians are aware, vibration accelerates EWIS degradation. Intermittent problems are the bane of all aviation maintenance technicians. In addition, moisture accelerates corrosion of EWIS components. Maintenance, especially maintenance performed by personnel unaware of the EWIS susceptibility to damage, can cause significant degradation due to foreign objects or undue wire stress. The EWIS can be damaged due to malfunctions of other systems such as pneumatic system leakage or fluid leaks. Contaminants ranging from battery acid to waste system chemicals will degrade the system. Special care is required for hydraulic, deicing, waste and battery fluids. Heat,

Continued on following page

Continued from page 43

especially direct contact with a high heat source, accelerates system degradation.

In addition to information about wire degradation, AC 25-27 provides general guidance for maintenance. Technicians must ensure combustibles do not accumulate. Procedures may include some type of numerical limit or an interval between required cleanings. In order to determine the interval between cleanings, the person writing the procedure must analyze the system to determine the rate of material accumulation.

The document recommends not using the term detailed visual inspection since it leads the technician toward an eyes-only inspection when a more tactile approach may be warranted. Instead, AC 25-27 recommends the use of two terms. The first, detailed inspection, is defined as an intensive examination of a specific item, installation or assembly. In this case, supplemental lighting is appropriate, along with inspection mirrors or magnifiers. Moreover, the technician may need stands or ladders to reach the area being inspected. The technician may need to do some cleaning and perform a complicated access procedure, including the removal of access panels, shields or blocking components. A DET may also include an assessment of tightness or security.

In contrast, the other recommended inspection is defined as a general visual inspection. This inspection may also use a mirror or supplemental lighting and is made from within touching distance of the part of the system being inspected. Like the DET, the technician might need stands or ladders to gain proper proximity to the part being inspected. Unlike the DET, in most cases, a technician will not need to remove equipment or displace other wires or bundles.

In general, the person performing a GVI will be looking for degradation caused by the factors listed above. If any degradation is identified, the technician should determine what actions are necessary to address the problem and assess the potential for damage to adjacent systems.

In both types of inspections, the technician should clean the area enough to perform the inspection and minimize the buildup of dirt, grease or other contaminants.

The GVI fits the textbook definition of a zonal inspection since it's a general visual inspection of a defined area of an aircraft in order to make a broad assessment of airworthiness. AC 25-27 lists items that should be assessed for degradation.

These include:

- Wire and wire harnesses
- Connectors
- Switches
- Ground points
- Bonding braid or jumpers
- Wiring clamps or brackets
- Rail, conduit or tubing supports
- Circuit breakers, contactors or relays

In the AC, each of the above bullet points include between two and 12 subcategories.

AC 25-27 provides guidance for maintaining wiring installations, including:

- Clamping points
- Connectors
- Terminations
- Backshells
- Sleeving and conduits
- Grounding points
- Splices

Within the AC, each of the above bullet points include a paragraph of advice to the technician.

Certain areas of any aircraft have proven worthy of extra attention. The AC lists the following areas of concern:

- Wire raceways and bundles
- Wings
- Engine, pylon and nacelle area
- Accessory compartments and equipment bays
- Auxiliary power unit
- Landing gear and wheel wells
- Electrical panels and line replaceable units
- Batteries
- Power feeders
- Areas under galleys, lavatories and the cockpit
- Fluid drain plumbing
- Fuselage drain provisions
- Cargo bay underfloor
- Wiring subject to movement
- Access panels
- Under doors
- Under cockpit sliding windows
- Areas where wiring is difficult to access

Within the AC, each of the above bullet points includes a paragraph of advice.

The last section of AC 25-27 starts with a reminder from AC 43-13. The work done must be performed "in

such a manner and use materials of such a quality that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness)." The AC goes on to state some of the practices being used currently may compromise the integrity of the EWIS; therefore, the document identifies specific tasks where air carriers and air operators should implement stronger practices. These tasks fall under the following categories:

- Installation, repair or modification of wiring
- Structural repairs and STCs
- Aircraft deicing or anti-icing
- Inclement weather
- Component removal and installation relating to attached wiring
- Pressure washing
- Cleaning the EWIS in place
- Waste water systems
- Oil systems
- Hydraulic systems
- Gaining access
- Application of corrosion prevention compounds

Each of the bullet points above includes at least one and sometimes multiple paragraphs of advice.

Several appendices are included in AC 25-27. Appendix A includes a sample EZAP procedure. The final appendix (H) includes EZAP worksheets. Worksheet 4 is interesting since it includes a matrix to help the procedure developer determine how to choose the interval between inspections.

Although we may not use formal EZAP, we can find the zonal approach useful. Furthermore, AC 25-27 is quite comprehensive about the types of things about which we should be concerned, whether the aircraft is large or small. For example, a four-seat piston aircraft could be divided into the following zones: engine compartment; behind the instrument panel; cabin; and tail section. The AC is worth a look. Next month, we examine EWIS and EZAP in the context of instructions for continued airworthiness. ❑

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ON THE SHOP FLOOR

Top-pick Installation Add-ons

STORY BY LARRY ANGLISANO

Including useful accessories with large retrofits could give your shop a competitive advantage.

Whether it's fragrances, smartphones or vehicles, in the retail world it's the add-ons that make an otherwise good sale an excellent one. The avionics retrofit world is no different, and there is no shortage of useful gadgets to tack on to a sale. Why leave money on the table by not offering worthwhile accessories with the main package?

Moreover, including even the most basic accessories in your proposal might be an easy way of closing a deal because it makes the quote look more complete and well thought out. Herewith are some top-pick accessories to consider and how you might present them to the customer.

The quote

First, let's look at the proposal process for shops and how you might make yours better. In many cases, potential customers are looking at more than dollar signs when digesting a big proposal. Use it as an opportunity to make your shop shine above the rest, because when it comes down

to it, overwhelmed buyers are looking for guidance at a time when they are about to write an eye-watering check. Plus, by including – or at least offering – some important accessories that the customer will ultimately have to source on their own shows the customer you have their best interest in mind, plus offering the convenience of sourcing all the stuff at the same place. And I'm not suggesting including anything for free, but instead just give them the option. Use caution not to bury add-ons in the quote.

As one example, if you include a panel USB charging hub that the customer didn't request when soliciting the proposal, let them know it's a worthy accessory that you thought would complement the installation, but are willing to remove if they don't want it. There's a good chance the customer will take it and appreciate the suggestion. The point is you won't know unless you try, plus it proves you're looking out for the customer by including a useful accessory that he hadn't considered.

Bose A30

Photo by Larry Anglisano

"I was so overwhelmed by the decision-making process of configuring the new layout, deciding on screen size and the task of getting the aircraft to and from the shop that I didn't even think about what portable unit I was going to use for ADS-B traffic and weather. It sure would have been nice for the shop to source it and hardwire it while they had the aircraft," a hangar neighbor told me after fetching his plane from the shop for a $60,000 upgrade. The customer bought nearly $4,000 worth of headsets and other electronics via mail order that he would have bought from the shop if it offered them.

Face it, the pilot gadget market is huge, and there are some popular ones that your customers will likely source to complement new avionics installs – no matter how basic or extensive the retrofit is. Here's my short list of proven good-performing ones you might suggest, starting with headsets – which nicely complement a modern audio panel upgrade. I'm always amazed to see some pilots using old, passive headsets with a suite of the latest avionics and then complain about poor audio quality. You can suggest and even sell them the good ones.

Bose A30

Bose consistently earns high marks for comfort and performance, and the latest A30 is no different. Priced a bit higher than the old and discontinued (but still supported) A20, the $1,249 A30 isn't much lighter than the old set, but with its redesigned center-spring headband (the spring mechanism has been incorporated inside the structure) and reworked earcups, there's far less clamping pressure. That makes the set feel lighter and more comfortable on the head. It's more streamlined because the wires that interface the earcups and microphone are fully enclosed.

The A30 was designed to be quieter, too, with digital electronics as opposed to the analog circuitry in the A20. There's also a feature that trickles down from the company's ProFlight Series 2 in-ear set for jets that allows the user to switch between three modes of ANR operation to allow easier talk-through conversations. It might not be a useful feature in louder pistons, but it works for some turbines. Sell enough headsets, and it's worth maintaining a Bose dealership. There isn't a huge profit margin, but you'll be saving the customer some effort by providing it, while turning out a well-rounded suite. Visit bose.com for more information.

If you wanted to offer another worthy choice (offer the option), it might be the Lightspeed Delta Zulu headset, which has a built-in CO detector and a host of other useful features. And like the Bose, the new Delta Zulu gets high marks for comfort. For users with hearing problems, the Delta Zulu offers some utility that's called Hearing EQity. It precisely tweaks the headphone audio after the user completes a 12-frequency hearing analysis of each ear.

Like the Bose, the lithium-ion-powered and Bluetooth-equipped Lightspeed can plug into a 6-pin LEMO connector for ship's power. The LEMO interface is something else you can include in the installation,

Continued on following page

Continued from page 47

especially if the customer already has a Bose or Lightspeed, but still uses batteries. Many customers don't know the option exists. Visit lightspeedaviation.com for more information.

Portable ADS-B receiver

This is a worthy add-on for entry-level, utilitarian installations that don't have ADS-B In capability. The ForeFlight Sentry series are made by uAvionix for ForeFlight, and you can buy them through Sporty's. All the models are priced fairly and pack a lot of features in a compact footprint. The entry-level Sentry Mini is built to save even more space and is stripped of an internal battery (it's powered by external USB-C input), built-in AHRS, pressure altitude sensor and some other sensors/features that are standard in the higher-priced Sentry models.

Both the Sentry and Sentry Plus are equipped with a built-in CO detector – a good utility in installations that don't have a permanent-mounted detector. The Sentry Plus is larger because it has a built-in display and more sensors and has a built-in flight data recorder. The function automatically captures track, altitude, attitude, groundspeed and G-load data logged from Sentry Plus for every flight. The recorder automatically starts a track log each time the Sentry Plus is powered on, and it automatically records track logs continuously until powered off. Give the customer the option based on price and features. The Sentry Mini is $349, the Sentry is $599, and the flagship Sentry Plus is $799. Visit sportys.com for more information.

And, of course, Garmin offers its own portable ADS-B receiver with the GDL series. The base model is the $795 GDL 50, and it's equipped with a dual-channel (978/1090 MHz) ADS-B In traffic receiver. There's no ADS-B Out, of course, but the device outputs the ADS-B data via Bluetooth to tablet, smartphone and Garmin portable GPS displays. Priced at $745, the GDL 51 is a SiriusXM receiver and doesn't have an ADS-B receiver, although it does have a built-in WAAS GPS for sending position, speed and backup attitude data to Garmin's Pilot app and select portable GPS units. The flagship device is the GDL 52, and it's priced at $1,240. It has a dual-channel ADS-B receiver, WAAS GPS and also a SiriusXM receiver for broadcast datalink weather and SXM entertainment.

What I like about the GDL 50 series is the connection with multiple devices/displays at the same time. For example, with the optional power/data interface harness, you could hard-wire the GDL to two additional displays, for a total of four when you count the two Bluetooth displays. Maybe you have the GDL connected wirelessly to an iPad and an iPhone but also want to connect to a hard-wired aera 660 or 796 GPS.

Since the GDL 51 and GDL 52 receive SiriusXM entertainment programming, you can access SXM channels directly on the Pilot app and wirelessly connect the audio to a Bluetooth-equipped audio panel. The GDL 51/52 also have wired audio output (a 3.5 mm stereo jack) for wired music out.

Continued on page 60

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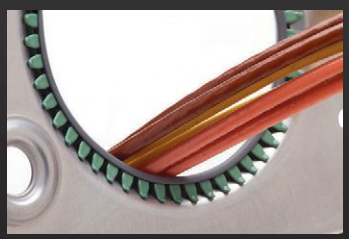

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March 18–21, 2025

AEA PHOENIX 2025

CONVENTION INFORMATION

Release date: January 2025

CONVENTION DATES:
MARCH 18-21, 2025

TRADE SHOW DATES
MARCH 19-20, 2025

LOCATION OF CONVENTION & TRADE SHOW:
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PHOENIX, ARIZONA

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- *Link:* **aea.net/convention**
- *Room rate:* **$269**
- *Deadline for reservations:* **Feb. 21, 2025**

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- PS Engineering
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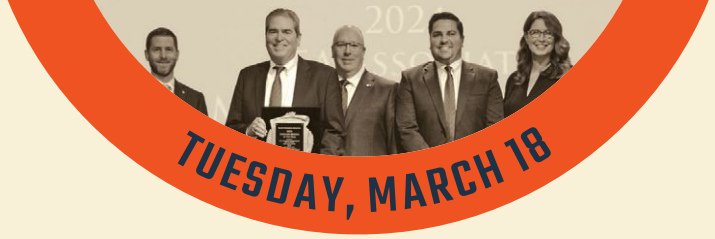

7 A.M. – 5 P.M.

AEA Registration Open

7:30 A.M. – 8:15 A.M.

AEA Regulatory Rise & Shine

Moderated by Ric Peri, AEA vice president of government & industry affairs

The opening Regulatory Rise & Shine offers a thoughtful, substantive and insightful source of regulatory news and information that affects you, your customers and your business. This Rise & Shine is dedicated to the most current aviation news, information and events. The specific topics are driven by the regulatory agenda, international agreements and new technologies being introduced.

8 A.M. – 8:30 A.M.

Coffee and Pastries

Sponsored by Innovative Solutions and Support

8:30 A.M. – 10 A.M.

Opening Ceremony & AEA Awards

Sponsored by Gogo Business Aviation

- Chairman's Welcome
- President's State of the Association Address
- AEA Awards
- Keynote Speaker

10 A.M. – NOON

New Product Introductions

See the exciting NEW products and services manufacturers will introduce to their dealers and the avionics marketplace for 2025 and beyond. This is one of the most anticipated sessions every year!

NOON – 1 P.M.

Lunch On Your Own

1 P.M. – 5 P.M.

Training Sessions

All OEM sessions are approved for credit toward the AEA's Avionics Training Excellence Award, as well as eligible for FAA IA renewal and AMT Awards Program.

Check out aea.net/convention for complete training descriptions.

Training Categories: **Technical** **Business**

5:30 P.M. – 7:30 P.M.

First-Nighter Event

"Take Me Out to the Ballgame" – It's spring training season in Arizona! Come experience the fun and food of the great American pastime.

Event location: Phoenix Convention Center.

Your convention badge is required for entry.

AVIONICS FUNDAMENTALS

Navigating Basic Troubleshooting Techniques

Presented by Don Dominguez, owner, San Luis Avionics

This session is tailored to provide participants with a solid grounding in identifying and addressing common avionics challenges. We will unveil common pitfalls and arm attendees with practical techniques to diagnose and rectify issues, and we will discuss the tools and techniques for troubleshooting. This training is suitable for beginners and those looking to solidify their foundational knowledge to help be your compass in the complex world of avionics.

This session also takes place Wednesday, March 19.

CCX TECHNOLOGIES

T-RX 101: Revolutionizing Avionics Testing with the T-RX Radio & Pulse Tester

This session also takes place Thursday, March 20.

COLLINS AEROSPACE

Pro Line Fusion Upgrades

Presented by Paul Jones, senior manager, field service engineering

This session covers installation training for Pro Line Fusion upgrade to aircraft that includes multi-scan weather, SVS and touchscreen controls. It includes upgrade path options for King Air and CJ fleet aircraft.

DANIELS MANUFACTURING

Mastering Cable Management: Best Practices for Efficiency and Reliability

In this hands-on training session, participants will learn how to streamline cable management using the innovative LaceLok technology. Designed for aerospace, military, and high-reliability applications, LaceLok provides a secure, durable, and lightweight solution for cable bundling. This course will cover step-by-step installation guidance, tips for complex wire harnesses, and extended benefits such as warranty tagging and identification. Join us to discover how LaceLok can improve cable management in your organization.

DANIELS MANUFACTURING

Precision in Practice: Component-to-Tooling Selection Training

Join an in-depth presentation on selecting the right tools for electrical wiring interconnection system (EWIS) components. This session will cover essential guidelines and best practices for choosing precision tools that ensure reliability, compliance, and efficiency in aerospace wiring applications.

FREEFLIGHT SYSTEMS

Dual-Band ADS-B

Presented by Brad Brunson, director of customer support

Participants will learn about FreeFlight Systems' advanced Dual-Band ADS-B solution, which integrates TCAS II to enhance pilot situational awareness and decision-making. This system seamlessly integrates with existing glass cockpits and in-flight applications such as ForeFlight, WingX Pro, iFly GPS, eKneeboard, Jeppesen FlightDeck, Avare, and FlyQ EFB, among others.

Key takeaways include:

- ***Real-time traffic data:*** *Understand how ADS-B In delivers accurate information on nearby aircraft, improving routing efficiency and reducing go-arounds.*
- ***Hybrid surveillance:*** *Explore how the integration of TCAS II with ADS-B In allows pilots to receive timely traffic alerts on a unified cockpit interface, significantly reducing workload.*
- ***Cost-effective retrofit options:*** *Discover how this solution provides a budget-friendly way to upgrade older aircraft, ensuring compliance with modern air traffic management standards and extending operational life.*

GENESYS AEROSYSTEMS

3100 Software Version 1.6 and Genesys Software Tools

Presented by Eric McFalda, technical trainer

This session provides an in-depth overview of 3100 autopilot software, focusing on the features and functionality of Version 1.6. Participants will learn about key software updates, enhancements, and operational improvements in this version, along with how these changes impact autopilot performance and integration in various aircraft. Additionally, the session covers the Genesys Software Tools, highlighting their role in facilitating software management, diagnostics, and updates for the 3100 system.

This session also takes place Wednesday, March 19, and Thursday, March 20.

GOGO BUSINESS AVIATION

Gogo 5G Installation Training

Presented by Nathan Bailey, senior product trainer

This session covers the installation, configuration, and troubleshooting of Gogo 5G hardware, including the X3 Transceiver, AVANCE LX5, and MB13 antennas. It will meet the training requirements for Gogo dealers and OEMs to purchase 5G equipment.

IFR AVIONICS IN REAL-WORLD FLYING

What every avionics shop needs to know

Presented by Gary Reeves, founder, PilotSafety.org

A brief intro to learning how pilots use the avionics you install in the real world. We will cover the value of how some basic pilot training can give technicians, sales/marketing professionals and shop owners a common language/vocabulary with the pilots who want to buy your avionics.

- *Pilots get everything they need.*
- *Avoid repeated work order changes and delays.*
- *Avoid dangerous misunderstandings that can put pilots in danger.*

This session also takes place Thursday, March 20.

INNOVATIVE ADVANTAGE

Aircraft Network Troubleshooting 101

Presented by Greg Cornell, president

Join IA for an exciting session on the basics of aircraft Ethernet network troubleshooting. Business jets today are flying computers, and the tools and methods for isolating, troubleshooting, and resolving issues is vastly different than in the past. This training session is an introduction to the basics of troubleshooting aircraft networks. This is a generic, non-vendor class that is applicable to connectivity systems, in-flight entertainment, cabin management systems, and more. No prior networking, computer or other experience is required.

LITHIUM BATTERY INSTALLATIONS

Lithium battery installations have been a challenge over the last 10 plus years, due to the perception of a potentially volatile failure mode. The AEA and industry have worked together to educate the FAA, produce factual data on reliability and apply lessons learned to make strides in simplifying installations. This session will go over lithium battery installation history and the new guidance to demonstrate how to manage these types of alterations.

QUANTITY VERSUS MARGINS

Presented by Bruce Baxter, AEA regulatory consultant

Are you making a profit on your sales? In this session we will look at the revenue created by various sales methods and the correct way to analyze and measure the profit. We will also discuss how to set a target to return the profit you require.

This session also takes place Thursday, March 20.

RVSM OPERATIONS IN THE NEW ADS-B AIRSPACE

Presented by Don Dominguez, owner, San Luis Avionics

Explore the intricacies of operating within RVSM airspace in the era of ADS-B. This comprehensive session will cover the following critical topics:

- ***Current RVSM Operational Approvals***
- ***ADS-B Out Performance Compliance***
- ***RVSM Equipment Requirements***
- ***Advisory Circular 91-85B***

SKYTRAC SYSTEMS

Introducing SKYTRAC's UAM/AAM Connectivity Product Line

Presented by Iain Ronis, director of product management

Designed for the wide range of aerial vehicles being developed for eVTOL and advanced air mobility, SKYTRAC's IMS family of products introduces a new flexible approach to assured connectivity and flight operations monitoring. Learn more about this groundbreaking solution and lightweight Iridium Certus options.

STEEL WINGS

Building Mental Resilience in the Aviation Industry

Presented by Alyssa Connell, CEO, Connell Aviation Group

This session will explore the essential tools and strategies for building mental resilience in the fast-paced, high-pressure aviation industry. Attendees will learn techniques to manage stress, enhance focus, and maintain motivation – even in challenging situations. Through interactive exercises and real-world examples, this session will empower participants to cultivate a resilient mindset that supports both personal well-being and professional performance.

This session also takes place Wednesday, March 19.

THE 3 MOST IMPORTANT QUESTIONS TO ASK CLIENTS ON THE FIRST PHONE CALL

Presented by Gary Reeves, founder, PilotSafety.org

Asking the right questions will help the aircraft owners get what they need, set realistic expectations, and most importantly, close the deals you want and avoid wasting time with the jobs that aren't right for you.

This session also takes place Thursday, March 20.

THE JOURNEY MATTERS

Transforming Touchpoints in Customer Experience

Presented by Alyssa Connell, CEO, Connell Aviation Group

This session will dive into the evolving expectations of customers in aviation and strategies for exceeding them. Attendees will gain insights into how technology, personalization, and proactive service can transform the customer journey from end to end. The session will include best practices and innovative approaches that make customer interactions a positive and memorable experience, driving loyalty and satisfaction.

This session also takes place Wednesday, March 19.

UAVIONIX

AV-30 Enhanced: Installation and Configuration of the AV-APA and AV-HSI Certified for IFR Flight

Presented by Rebekah Gambrell, product support manager

This is an in-depth session on the AV-30 system. The presentation is designed specifically for avionics installers looking to expand their expertise in modern avionics systems. The following key topics will be covered:

- ***Overview of the AV-30:*** *Learn about its features and benefits for IFR flight operations.*
- ***Installation Procedures:*** *Step-by-step guidance on installing the AV-APA and AV-HSI components, ensuring compliance with industry standards.*
- ***Configuration Best Practices:*** *Discover tips and techniques for optimal configuration, enhancing aircraft performance and safety.*
- ***Troubleshooting Common Issues:*** *Gain insights into resolving typical challenges faced during installation and configuration.*

This interactive presentation will also include a Q&A session, allowing attendees to share their experiences and seek advice from experts. Whether you're new to avionics or looking to refine your skills, this session will equip you with the knowledge needed to effectively work with the AV-30 system.

This session also takes place Wednesday, March 19.

VIAVI SOLUTIONS

Hidden features of the AVX-10K

Presented by Mark Anderson, business development

Discover features of the AVX-10K that you might not be aware of.

This session also takes place Wednesday, March 19.

WHAT IS CAN BUS?

Presented by Kevin Bruce, director of engineering and certification, AEA

This training session aims to provide a detailed overview of CAN Bus (Controller Area Network) technology, including its definition, differences from other communication protocols like Ethernet and RS-232, basic use applications, and insights into maintenance and troubleshooting.

7:30 A.M. – 3 P.M.

AEA Registration Open

7:30 A.M. – 8 A.M.

Coffee and Pastries

Sponsored by PIC Wire & Cable

8 A.M. – 10:30 A.M.

Training Sessions

All OEM sessions are approved for credit toward the AEA's Avionics Training Excellence Award, as well as eligible for FAA IA renewal and AMT Awards Program.

Check out aea.net/convention for complete training descriptions.

Training Categories: **Technical** **Business**

10:30 A.M. – 5 P.M.

Ribbon-Cutting & Exhibit Hall Opening

- Light lunch served in Exhibit Hall
- AEA Educational Foundation Silent Auction begins in Exhibit Hall

1:30 P.M. - 2:30 P.M.

AEA Canada Roundtable

For AEA Canada members only

AEA REGULATORY RISE & SHINE

A conversation with the regulatory authorities

Moderated by Ric Peri, AEA vice president of government & industry affairs

Aviation is a global industry that relies heavily on the international cooperation of the authorities and the ability to service and support aircraft regardless of state of registry. This session focuses on a conversation with the regulatory authorities impacting the AEA membership and features the FAA and Transport Canada. The authorities will offer their perspective on the import and export of aviation products and services with an emphasis on the installation and maintenance of avionics products.

AEM

How to Install and Operate the MTP136D Panel-Mount P25 Forest Service Radio

Presented by Steve Broderick, sales and business development

Learn how to install, program and operate the MTP136D panel-mount P25 VHF FM forest service radio. Designed with the U.S. Forest Service and aerial firefighting operators in mind, the MTP136D is a Project 25 Phase 1 compliant VHF FM solution for digital and analog communication on all channels across the 136 MHz to 174 MHz frequency band.

AIRCRAFT LIGHTING INTERNATIONAL

LED Lighting and PMA Approvals

Presented by Shervin Rezaie, sales director

This session offers an in-depth overview of LED lighting systems and their integration through parts manufacturer approval processes. Participants will gain a clear understanding of the benefits and regulatory considerations involved in replacing traditional aircraft lighting with LED solutions. Key topics include the technical advantages of LED lighting, the certification process for PMA parts, compliance with FAA regulations, and the impact of these approvals on aircraft maintenance and operations.

ASPEN AVIONICS

Exciting updates to the EFD Pro MAX product line, troubleshooting and installation tips

Presented by Michael Studley, director of field service

Learn about new capabilities for the EFD Pro MAX products, plus gain important insights for troubleshooting and installation.

AVIONICS FUNDAMENTALS

Navigating Basic Troubleshooting Techniques

Presented by Don Dominguez, owner, San Luis Avionics

This session is tailored to provide participants with a solid grounding in identifying and addressing common avionics challenges. We will unveil common pitfalls and arm attendees with practical techniques to diagnose and rectify issues, and we will discuss the tools and techniques for troubleshooting. This training is suitable for beginners and those looking to solidify their foundational knowledge to help be your compass in the complex world of avionics.

This session also takes place Tuesday, March 18.

GENESYS AEROSYSTEMS

3100 Software Version 1.6 and Genesys Software Tools

Presented by Eric McFalda, technical trainer

This session provides an in-depth overview of 3100 autopilot software, focusing on the features and functionality of Version 1.6. Participants will learn about key software updates, enhancements, and operational improvements in this version, along with how these changes impact autopilot performance and integration in various aircraft. Additionally, the session covers the Genesys Software Tools, highlighting their role in facilitating software management, diagnostics, and updates for the 3100 system.

This session also takes place Tuesday, March 18 and Thursday, March 20.

GOGO BUSINESS AVIATION

Gogo Galileo Installation Training

Presented by Nathan Bailey, senior product trainer

This session discusses the installation of Gogo's new Galileo Global Broadband system. Training will focus on the Half-Duplex and Full-Duplex Satellite Terminal Equipment hardware installation requirements, configuration and integration with the AVANCE platform, system indications, and system operation on the OneWeb LEO satellite network. It will meet the training requirements for Gogo dealers and OEMs to order Galileo hardware.

LAVERSAB

Avionics Radio Test Set: ARTS-7000

Presented by Kerry Nabors, aviation sales manager

The ARTS-7000 not only simplifies testing protocols but also enhances adaptability, making it an indispensable tool for aviation professionals across various sectors. This session will cover operations training, including radio communication, navigation, distance measuring equipment, Mode S, ADS-B, emergency locator transmitters, and how to utilize the wireless control and user-configurable interface.

This session also takes place Thursday, March 20.

NATA COMPLIANCE SERVICES

Top 10 Best Practices for Anti-Drug and Alcohol Program Managers

Presented by Claudia Culmone, marketing communications manager

What are the secrets to running a successful anti-drug and alcohol misuse prevention program? Having more than 20 years of experience as a third-party administrator and a subject-matter expert, NATACS will discuss regulatory definitions; training requirements; company policy; random testing and medical marijuana; and FAA inspections.

ONE MILE UP

Panel Planner Revolution

Presented by Gene Velazquez, manager

Repair stations will learn about the latest in panel design, fabrication, wiring, work orders, BoM, and purchase orders. Come in and fasten your seat belt.

This session also takes place Thursday, March 20.

STEEL WINGS

Building Mental Resilience in the Aviation Industry

Presented by Alyssa Connell, CEO, Connell Aviation Group

This session will explore the essential tools and strategies for building mental resilience in the fast-paced, high-pressure aviation industry. Attendees will learn techniques to manage stress, enhance focus, and maintain motivation – even in challenging situations. Through interactive exercises and real-world examples, this session will empower participants to cultivate a resilient mindset that supports both personal well-being and professional performance.

This session also takes place Tuesday, March 18

TEL-INSTRUMENT

SDR-OMNI Operations Training

Presented by Kevin Orach, director of U.S. sales

SESSION OBJECTIVE: To provide the attendees with an overview and understanding of all the features and functions of the SDR-OMNI Avionics Test Set to include:

- *Remote operation via phone, tablet, or computer using SDR-OMNI Wi-Fi hotspot*
- *Familiarization with all hardware and accessories provided*
- *Overview of SDR-OMNI touchscreen menu structure and setup parameters*
- *Creation, storage, and printing of test reports (transponder, ADS-B 1090 MHz Out, and ELT)*

Testing in the following:

- *ATC Transponder IAW FAR Part 43 Appendix F*
- *ADS-B 1090 MHz Out/In and UAT 978 MHz Out/In*
- *FIS-B testing and NEXRAD radar pattern generation*
- *TCAS*
- *DME*
- *VOR*
- *ILS with associated GS and MB components*
- *Comm radios (HF, VHF, UHF) testing (AM/FM)*
- *Aircraft Intercom System*
- *SELCAL*
- *ELT/EPIRB*
- *VSWR/Distance to Fault/Cable Loss measurement*

THE JOURNEY MATTERS

Transforming Touchpoints in Customer Experience

Presented by Alyssa Connell, CEO, Connell Aviation Group

This session will dive into the evolving expectations of customers in aviation and strategies for exceeding them. Attendees will gain insights into how technology, personalization, and proactive service can transform the customer journey from end to end. The session will include best practices and innovative approaches that make customer interactions a positive and memorable experience, driving loyalty and satisfaction.

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UAVIONIX

AV-30 Enhanced: Installation and Configuration of the AV-APA and AV-HSI Certified for IFR Flight

Presented by Rebekah Gambrell, product support manager

This is an in-depth session on the AV-30 system. The presentation is designed specifically for avionics installers looking to expand their expertise in modern avionics systems. The following key topics will be covered:

1. ***Overview of the AV-30:*** *Learn about its features for IFR flight operations.*
2. ***Installation Procedures:*** *Step-by-step guidance on installing the AV-APA and AV-HSI components, ensuring compliance with industry standards.*
3. ***Configuration Best Practices:*** *Discover tips and techniques for optimal configuration, enhancing aircraft performance and safety.*
4. ***Troubleshooting Common Issues:*** *Gain insights into resolving typical challenges faced during installation and configuration.*

This interactive presentation will also include a Q&A session, allowing attendees to share their experiences and seek advice from experts. Whether you're new to avionics or looking to refine your skills, this session will equip you with the knowledge needed to effectively work with the AV-30 system.

This session also takes place Tuesday, March 18.

VIAVI SOLUTIONS

Hidden features of the AVX-10K

Presented by Mark Anderson, business development

Discover features of the AVX-10K that you might not be aware of.

This session also takes place Tuesday, March 18

WHEN TO USE A DER FOR ALTERATIONS

As the person completing an alteration, you are responsible to ensure you have all the acceptable data to conduct the alteration. It is important to understand when and when not to use a designated engineering representative. It is also important to understand what specialties may be involved. This session will take you through the steps and methods to use in order to determine the need for a DER.

THURSDAY, MARCH 20

7:30 A.M. – 3 P.M.

AEA Registration Open

7:30 A.M. – 8 A.M.

Coffee and Pastries

Sponsored by West Star Aviation

8 A.M. – 6:30 P.M.

Delegates Conference

- FAA/TCCA Roundtable: *8 a.m. – Noon*
- Coffee Break sponsored by *Metrea Aerospace Design*
- Exhibit Hall: *Noon – 5 p.m.*
- Networking Event: *5 p.m. – 6:30 p.m.*

8 A.M. – 10:30 A.M.

Training Sessions

All OEM sessions are approved for credit toward the AEA's Avionics Training Excellence Award, as well as eligible for FAA IA renewal and AMT Awards Program.

Check out aea.net/convention for complete training descriptions.

Training Categories: **Technical** **Business**

10:30 A.M. – 5 P.M.

Exhibit Hall Open

- Light lunch served in Exhibit Hall
- AEA Educational Foundation Silent Auction ends at 3 p.m.

10:30 A.M. - 11:30 A.M.

AEA South Pacific Roundtable

For AEA South Pacific members only

AVIATION GENERAL LIABILITY, THE FINE PRINT

Presented by Kyle White, aviation practice leader, MarshMcLennan Agency

Learn what exposures the traditional avionics shop has and how to customize your general liability policy so you have the coverage you thought you would have in the event you break a customer's aircraft.

AVIONTEQ

Introduction to the HHMPI SRVIVR25 System

Presented by Brad Brunson, director of customer support, FreeFlight Systems

Overview of the HHMPI SRVIVR25 Interface Cable and its applications. Explanation of the associated software features and functionality.

BACK TO BASICS

Customer Supplied Parts and the Importance of Traceability

Presented by Ric Peri, AEA vice president of government & industry affairs

Ensuring proper traceability of parts is essential for a repair station to verify the suitability of components used in maintenance and alterations. This session will cover key aspects of parts acceptability, including new, used, and customer-supplied parts. Additionally, we will explore various acceptable methods for demonstrating traceability, a critical requirement for all repair stations.

CCX TECHNOLOGIES

T-RX 101: Revolutionizing Avionics Testing with the T-RX Radio & Pulse Tester

This session also takes place Tuesday, March 18.

COLLINS AEROSPACE

Venue Cabin Management Systems

Presented by Paul Jones, senior manager, field service engineering

Explore the critical aspects of Venue Cabin Management Systems, focusing on best practices, integration challenges and the latest technologies to enhance passenger comfort and operational efficiency.

GENESYS AEROSYSTEMS

3100 Software Version 1.6 and Genesys Software Tools

Presented by Eric McFalda, technical trainer

Session provides an in-depth overview of 3100 autopilot software, focusing on the features and functionality of Version 1.6.

This session also takes place Tuesday, March 18 and Wednesday, March 19.

GOGO BUSINESS AVIATION

Gogo C1 Installation Training

Presented by Nathan Bailey, senior product trainer

This session discusses the installation of the Gogo C1 EVDO/LTE Transceiver. Training focuses on the differences between the C1 and Classic ATG, wiring modification considerations when replacing a Classic ATG with the C1, and system configuration and test. It will meet the training requirements for Gogo dealers and OEMs to purchase the C1.

IFR AVIONICS IN REAL-WORLD FLYING

What every avionics shop needs to know

Presented by Gary Reeves, founder, PilotSafety.org

A brief intro to learning how pilots use the avionics you install in the real world. We will cover the value of how some basic pilot training can give technicians, sales/marketing professionals and shop owners a common language/vocabulary with the pilots who want to buy your avionics.

- *Pilots get everything they need.*
- *Avoid repeated work order changes and delays.*
- *Avoid dangerous misunderstandings that can put pilots in danger.*

This session also takes place Tuesday, March 18.

LAVERSAB

Avionics Radio Test Set: ARTS-7000

Presented by Kerry Nabors, aviation sales manager

The ARTS-7000 not only simplifies testing protocols but also enhances adaptability, making it an indispensable tool for aviation professionals across various sectors. This session will cover operations training, including radio communication, navigation, distance measuring equipment, Mode S, ADS-B, emergency locator transmitters, and how to utilize the wireless control and user-configurable interface.

This session also takes place Wednesday, March 19.

NATA COMPLIANCE SERVICES

FAA/DOT Inspection Preparation

Presented by Claudia Culmone, marketing communications manager

Did you know that FAA inspectors are not required to provide advanced notice of an inspection? During this presentation, attendees will learn the best methods to keep their anti-drug and alcohol misuse prevention program on track. This includes going through the inspection checklist, understanding program requirements, and keeping organized for a violation-free inspection.

ONE MILE UP

Panel Planner Revolution

Presented by Gene Velazquez, manager

Repair stations will learn about the latest in panel design, fabrication, wiring, work orders, BoM, and purchase orders. Come in and fasten your seat belt.

This session also takes place Wednesday, March 19.

PS ENGINEERING

Cockpit Audio Panel Solutions for General Aviation, Special Mission and Business Aircraft

Presented by Greg Ledbetter, business development

This will offer a deep dive into the audio panel solutions available for all aircraft markets. The session will discuss the details and benefits of upgrading and how it will save valuable installation time and money to both the shop and the customer. It will also share more information about PS Engineering's new product announcement.

QUANTITY VERSUS MARGINS

Presented by Bruce Baxter, AEA consultant

Are you making a profit on your sales? In this session we will look at the revenue created by various sales methods and the correct way to analyse and measure the profit. We will also discuss how to set a target to return the profit you require.

This session also takes place Tuesday, March 18.

REMEMBER WHAT YOU ARE GOOD AT

Presented by Bruce Baxter, AEA consultant

It is common knowledge that there is a worldwide shortage of qualified avionics technicians. This session will look at the progression of avionics maintenance organizations and how the business has evolved into what it is today. Attendees will gain an understanding of the dynamics of their business as we focus on the shortage of avionics technicians and how to overcome the issues and hire valuable staff.

THE 3 MOST IMPORTANT QUESTIONS TO ASK CLIENTS ON THE FIRST PHONE CALL

Presented by Gary Reeves, founder, PilotSafety.org

Asking the right questions will help the aircraft owners get what they need, set realistic expectations, and most importantly, close the deals you want and avoid wasting time with the jobs that aren't right for you.

This session also takes place Tuesday, March 18.

FRIDAY, MARCH 21

7:30 A.M. – 9 A.M.

AEA Registration Open

7:30 A.M. – 8 A.M.

Coffee and Pastries

8 A.M. – 3 P.M.

Delegates Conference

- Committee Update: *8 a.m. – 9 a.m.*
- HIRF and Lightning: *9 a.m. – 11 a.m.*
- Antenna Installation and Considerations Beyond Avionics: *11 a.m. – 2 p.m.* (lunch break at noon)
- Q&A Session: *2 p.m. – 3 p.m.*

8 A.M. – 3:30 P.M.

Training Sessions

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Check out aea.net/convention for complete training descriptions.

Training Categories: **Technical** **Business**

NOON

Lunch On Your Own

GARMIN – 8 A.M. - 3:30 P.M.

Technical Training

Garmin's training will use the same two-room schedule like it did last year, with some improvements based on dealer feedback. There will be 30-minute and one-hour sessions scheduled in each room, and attendees can pick which sessions, in either room, they want to attend. Most sessions will be offered twice throughout the day. To qualify for Garmin dealer training requirement credit, attendees must participate in five of the seven hours of training. Attendance will be tracked electronically, so follow instructor directions closely.

The objective for Garmin's training is to provide participants with in-depth knowledge and skills related to installation, troubleshooting and configuration of Garmin products. The training will cover various administration topics and tools relevant to the field.

Training topics include:

- *New product training, including overview, quoting, operations and installation considerations.*
- *Discussion of the latest installation, troubleshooting, configuration and administrative topics from training classes and FSE calls.*
- *Garmin autopilot installation trends and troubleshooting tips for the GFC 500, GFC 600, and GFC 600H. Separate one-hour sessions will be conducted for each of these systems.*
- *GDL 60 installation and registration topics.*
- *TXi, GI 275, G3X, and G5 installation trends to include interface and configuration topics.*

GOGO BUSINESS AVIATION – 8 A.M. - NOON

In-flight Connectivity Foundations: IFC Networks and Services

Presented by Nathan Bailey, senior product trainer

What is in-flight connectivity and how does it work? This training session will discuss the various services within the IFC umbrella and how the aircraft accesses them, including traditional radios, air-to-ground, low-Earth-orbit satellite, and geostationary satellite networks. Gogo equipment will be used for examples, but the information provided is non-specific to any aircraft model, hardware package, or service provider.

SAFETY MANAGEMENT SYSTEM – 8 A.M. - NOON

SMS Coordinator Training

Presented by Ric Peri, AEA vice president of government & industry affairs

AIRCRAFT LIGHTING INT'L

Aircraft Spruce & Specialty Co. SINCE 1965

APPAREO

AVIDYNE

ASI

ADS AVIATION DESIGN AND SUPPLY

Blue Avionics

Collins Aerospace

BANYAN

DUNCAN AVIATION

DALLAS AVIONICS, INC.

FIELDTECH AVIONICS & INSTRUMENTS, INC.

GIGAFLIGHT CONNECTIVITY INC.

FORMAT AEROSPACE

gogo BUSINESS AVIATION

ISS Innovative Solutions & Support

Innovative Advantage

Metrea

MidContinent INSTRUMENTS+AVIONICS

Millennium International AVIONICS

PSI Pacific Southwest Instruments

PENTASTAR

PIC WIRE & CABLE

CONVENTION SPONSORS

SANDIA aerospace

TRUE BLUE POWER® A division of Mid-Continent Instrument Co., Inc.

sporty's®

WEST STAR AVIATION

Continued from page 48

Portable transceiver

A reliable handheld transceiver is a necessary accessory in every cockpit, and you don't have to spend a lot of money for a decent one, including the $199 Sporty's PJ2+. The PJ2+ comes standard with a six-AA alkaline battery pack, and for a portable radio I prefer alkaline over rechargeable because they have good storage life. That's important, because if the radio is used for backup only, it might sit for long periods. But you can always carry extra batteries or take them out of the radio when you aren't using it. Battery life will depend on how often you key the transmitter, and Sporty's offers an $80 rechargeable pack. The radio comes with a USB-A to USB-C power cable for external power. For full operation, the unit requires 2.4 amps of power input; anything less and it will receive, but not transmit. And, when using external power (2.4 amps from the USB input) the transmitter is limited to 5 watts.

Sentry Plus

Photos by Larry Anglisano

The PJ2+ is an improvement over the original PJ2, with a better LCD display that has a higher contrast making it easier to see in sunlight, but it also does a good job of cutting glare. The viewing angle is wider, too, so if the customer plans to mount it someplace in the cockpit they'll have more options. The display even has a night mode.

But perhaps the best feature of the Sporty's radio is the onboard headset jacks for plugging the headset directly in without an adapter. Sporty's even makes a version (the L6) with a standard 6-pin LEMO jack. Install a dedicated emergency comm antenna (another good add-on accessory) and the customer has a seamless and capable backup that can work nearly as reliably as the panel-mounted radio. Contact sportys.com for more information.

Sporty's PJ2+

Garmin eLearning Courses

Some of these are cheap enough to throw in for free in a big project, and it could take the sting off the learning curve of a new retrofit. Garmin's GFC 500 Autopilot Essentials eLearning Course ($26.95) was designed to provide a comprehensive understanding of the GFC autopilot components and features as well as best practices in an operational context. I took it and got a lot out of the content. The course describes the autopilot controls and their functions, associated annunciations, and reviews the advanced features such as Electronic Stability and Protection and Smart Glide. The course uses interactive flight scenarios for the user to interact with the GFC 500 to better understand using the controls and features – a huge help when workload gets high.

There's also the GTN Essentials 2.0 eLearning Course priced at $116.95 and focuses on comprehensive training for GTN and GTN Xi series touchscreen navigators. Users of the GPS 175, GNX 375 and GNC 355 navigators will also benefit from this course. Throughout the course, common scenarios will be used to demonstrate how to successfully use these products in-flight – including typical high-altitude, medium-altitude and helicopter scenarios. When used in combination with the free Garmin GTN PC or iPad trainers, additional scripted scenarios and detailed guidance provide good opportunities for practice and familiarity. The point is that offering these inexpensive training solutions won't just help your customer conquer the steep learning curve, but it will keep them occupied while you work on the retrofit – a good distraction.

Wrap it up

You might have your own list of useful accessories to add to a retrofit, and it's worth some creative thinking to customize them to a given installation. Customers are drawn to shops that offer good ideas that expand the basics of an installation, and by offering them a one-stop-shopping option for useful accessories, they'll not only have confidence in your abilities to turn out a good product but might appreciate the convenience of not having to source them on their own. That can win you quotes that might otherwise end up at the competition. ❑

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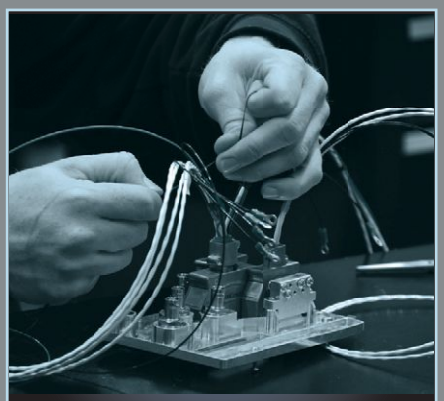

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